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THE INDEPENDENCE OF MANCHOUKUO

By GEORGE BRONSON REA

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The Independence of Manchoukuo

By *GEORGE BRONSON REA*, Counsellor to The Ministry of Foreign Affairs, Government of Manchoukuo

Paper Read before the Students of the Law School of George Washington University,
Washington, D.C. on November 23, 1933

THE MANCHOUKUO-JAPAN PROTOCOL

"Whereas Japan has recognized the fact that Manchoukuo, in accordance with the free will of its inhabitants, has organized and established itself as an independent State; and

"Whereas Manchoukuo has declared its intention of abiding by all international engagements entered into by China in-so-far as they are applicable to Manchoukuo;

"Now, the Governments of Manchoukuo and Japan have, for the purpose of establishing a perpetual relationship of good neighborhood between Manchoukuo and Japan, each respecting the territorial rights of the other, and also in order to secure the peace of the Far East, agreed as follows:

(1) Manchoukuo shall confirm and respect in-so-far as no agreement to the contrary shall be made between Manchoukuo and Japan in the future, all rights and interests possessed by Japan or her subjects within the territory of Manchoukuo by virtue of Sino-Japanese treaties, agreements or of Sino-Japanese contracts, private as well as public;

(2) Manchoukuo and Japan recognizing that any threat to the territory or to the peace and order of either of the High Contracting Parties constitutes at the same time a threat to the safety and existence of the other, agree to co-operate in the maintenance of their national security, it being understood that such Japanese forces as may be necessary for this purpose shall be stationed in Manchoukuo."

It may seem somewhat paradoxical that an American should champion the cause of Manchoukuo at a time when our Government and the League of Nations have placed on record their decision to refuse recognition to the new State. I offer no apologies for defending a cause that in my humble opinion represents all those ideals and principles upon which human liberty and progress are founded. The League's condemnation of Manchoukuo was based on technicalities while our State Department is apparently more concerned for its treaties and policies than with the fundamentals. If, therefore, I differ with my own Government in these matters, it is because I hold that treaties, conventions, covenants and other pacts which contravene the basic principles of humanity cannot endure.

One great authority on public law has declared that "treaties that are in violation



H. E. Mr. Pu Yi

The Chief Executive of Manchoukuo, who in March will mount the Throne of the New State as Emperor

of human rights are but rags." If the Nine Power Treaty, the League Covenant and the Peace Pacts are interpreted as denying to the people of any part of China the right to break away from the chaos and anarchy recognized by the Powers as the Government of the Republic of China, and to set up their own government, they violate the fundamentals of civilization, and cannot be enforced. No treaties can stop the march of human progress or the everlasting struggle for justice and liberty. The two basic principles of our faith are first, that all men are equal in rights, and second, that just government stands on the consent of the governed. On these two great political commandments hang all laws, constitutions and treaties. The issue in Manchoukuo, as I see it, is the vindication of principles laid down in our own Declaration of Independence. The tenets of our faith have been subordinated to our Far Eastern policies.

I dislike to differ from men for whom I hold the highest regard with whom I for so long a time agreed, but the issues at stake in Manchoukuo are of such vital importance to the peace of the world and the preservation of those ideals on which our national life and human progress is founded, that a sense of public duty, not only to my own countrymen but to the people who have entrusted their case in my hands, compels me to take a stand so at variance with the policy of our Government and public opinion.

I would not have you believe that I uphold the infraction of treaties entered into in good faith. We may believe that Japan violated her commitments with us, but we can never convince the people of that country that they acted otherwise than in self-defense. It all depends upon the point of view. When I see one of the Signatories to the Peace Pacts openly resort to trade boycotts and complete severance of economic relations as instruments of national policy in order to bring financial ruin to another Signatory; when I see this same nation increase its armed forces to where they outnumber the combined standing armies of all other countries of the world, announce its intention to abrogate its treaties and the Powers make no move individually or in concert to defend their threatened interests, the time had to arrive when some incident would compel the nation most vitally affected to protect itself.

The Quiescence of the Powers

The Foreign Offices of every government had full and accurate knowledge of what was happening in China. They had all been warned that the Nanking Government would abolish extra-territoriality on the first of January, 1932; they all knew that any incident would touch off the explosion, yet no Power would act alone to defend its interests. As long as Japan's ox was being gored, the others looked on and secretly applauded. Japan's trade loss was their gain. They overlooked that the League Covenant contained no provision for penalizing a Member State for violating its treaties; that the Peace Pacts ignored that war could be waged just as aggressively and destructively by economic measures as by armed force and, that all Signatories reserved to themselves the right of self-defense and to interpret that right in their own fashion. Yet, when Japan, provoked beyond the limits of human endurance, broke out of the treaty trap and defended herself, the whole world unanimously condemned her. With perhaps a more intimate knowledge of the inside history of what has transpired in Eastern Asia during the past three decades, I may be pardoned if I cannot see eye to eye with those who so hastily judged and condemned Japan.

It was not my intention to plead the case of Manchoukuo. As far as the people of that country are concerned, the dispute over their independence is a closed incident. They have no further explanations to make for asserting their right to self-government, but before this audience, I will not be misunderstood if I reopen their case and clarify its main points.

I wish to make clear at the outset of my talk that I am not an official of the Manchoukuo Government. I am merely retained by the Ministry of Foreign Affairs of that Government as counsel to present and defend its case. I retain all my rights, privileges and duties as an American citizen. In this capacity, as one American speaking to another, I can express my views and interpret those of the Government and people of Manchoukuo with greater clarity and frankness than as a duly accredited diplomatic agent. If my opinions convey to you the impression that I am not in full sympathy with the policies of our State Department,

there are weighty reasons which have influenced me to take this stand. The trend of American diplomacy in the Far East will inevitably lead the nation into war.

The natural forces at work in Asia cannot be regulated by laws, treaties, anti-war pacts or any other Canute-like gestures. World disapproval can have no effect upon the procreative recklessness of a race whose religion is based on ancestor worship with the necessity of having as many male children as possible to keep up the cult. It is too late now to side-step the basic issue of the Pacific. One of these Asiatic countries must find an outlet and if not permitted to overflow into its own natural sphere, as the pressure from within mounts higher, it will follow the irrevocable law of nature and break through at the weakest point.

If the good people of the United States confide their future security and happiness to paper doctrines and place their trust in treaties, reduce their fleet and raze their forts, they must expect to be inundated by the flood from Asia. If we are to persist in our present Far Eastern policies we must prepare and quickly to face the issues our sentimental diplomacy is forcing upon the nation. We can avert the catastrophe only by compounding amicably our differences with Japan, recognizing her right to exist and apply in her own sphere the same measures for security we insist upon for ourselves in our sphere. We can make of Japan a permanent friend and ally instead of a potential enemy; can turn the Pacific Ocean into a highway of peaceful commerce and reduce the war-fleets of both nations to a new low level ratio if we permit common-sense to overrule our sentiment. But if we refuse to modify our attitude toward these problems, if the United

States insists upon guaranteeing the territorial integrity of China and Asiatic Russia; if we continue to build a ring fence around Japan and confine her to a watertight compartment; if we place ourselves squarely across the path of her expansion in her own natural sphere; if we sit on Japan's safety valve while she is going full steam ahead; we must be prepared for the consequences. If that is to be our policy, then I say to my countrymen, get ready to fight!

If there was any vital interest of the United States involved, I would say that the sooner the war is fought and over with, the better. If the United States could even derive any material benefit from such a war, I might even be sordid enough to say let's have it out now. But there is absolutely nothing we can get out of a war with Japan. If we win, we lose. We have all we can do in our own hemisphere to safeguard

our vital security and uphold the Monroe and Caribbean Doctrines. If, on top of this, we are to guarantee China and Asiatic Russia against aggression and dismemberment, then in the name of common-sense, let's get busy and build up a navy to enforce respect for our doctrines. Personally, I see no good reason why the young manhood of America should fight Japan for the sake of five hundred million people who will not fight for themselves.

No Real Issues Involved

There are no issues between the United States and Japan that cannot be amicably adjusted if there is a will for peace on both sides. The people of the United States are not interested in these Far Eastern disputes. They will never consent to be dragged into a war in the Pacific unless Japan forces the issue. The rulers and people of Japan do not want to fight the United States. They will make any sacrifice compatible with their honor and dignity to be assured of the good-will and friendship of this country. They insist however on their right to self-defense and to interpret that right in their own way. As you will gather from what I have to



Signing the Manchoukuo-Japan Protocol

At the Office of Manchoukuo's Chief Executive on September 15, 1932. Seated on the right and affixing his seal and signature in His Excellency Mr. Cheng Hsiao-hsu, the Prime Minister and opposite him is the late General Nobuyoshi Muto, who at that time was Japanese Ambassador Extraordinary and Plenipotentiary. His Excellency the Foreign Minister, Mr. Hsieh Chieh-shih, can be seen standing third from the left

say about Manchoukuo, this is the dominating motive for what Japan has done in that country and that the only obstacle to the full attainment of these aims is the doctrine promulgated by Secretary Stimson and endorsed by the League of Nations. You will also sense that this doctrine should not apply to Manchoukuo for the reason that Japan has not employed force to conquer or annex that territory. The Doctrine simply denies to the people of that country the exercise of those rights upon which our own national life and ideals are founded. With this brief explanation, I will return to the main subject of my talk.

The people of Manchoukuo reject the technicalities and legalities employed by the League and the American Government to condemn and outlaw the new State. They brush aside the covenants, treaties, doctrines, policies and the complicated jargon of the professional diplomats and stand firmly on basic principles. The President of the United States in his recent address to the Woodrow Wilson Foundation advocates and approves of appealing from the verdicts of blundering governments to the common-sense of their peoples as the most efficient method of doing away with wars and as the only way to overcome the arguments, excuses and objections interposed by short-sighted statesmen and diplomats to cover up their mistakes. If war by governments is to be changed to peace by peoples; if American statesmen are conceded the privilege of going over the heads of foreign governments and appealing directly to their peoples in order to gain support for their policies and doctrines, the rule to be fair, must work both ways. If the American Government will not enlighten the people of this country as to the dangers and pitfalls surrounding its own diplomacy, we must not be surprised or offended if spokesmen for other nations appeal direct to the American people against the policies of their government. There are always two or more sides to a controversy.

If one nation with all the facilities of world communications and publicity at its command arrogates to itself a monopoly to employ this machinery to marshal world opinion against another nation who lacks these mediums to adequately defend itself against such propaganda, it will end by engendering hatreds, animosities and strife. World opinion is moulded by the English-language press. It is easy enough for American statesmen to get their message across and have it emphasized prominently in the news columns of the leading papers of the world.

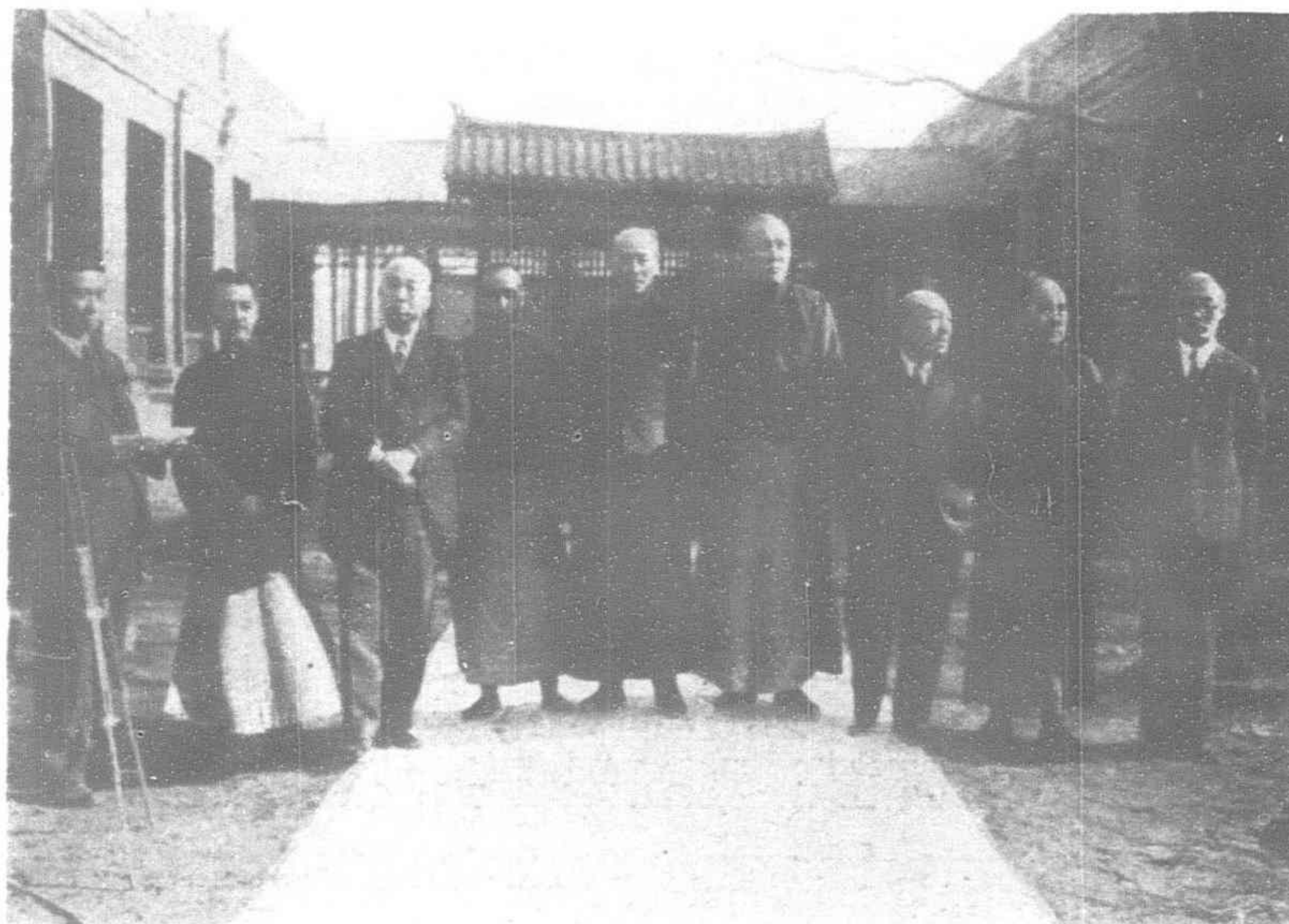
Japan and Manchoukuo are handicapped at the start in any such battle of wits or oratory. They stand condemned by the League of Nations without the right of appeal from its sentence. They see the handwriting on the wall and all they can do is to prepare to defend themselves. In view of President Roosevelt's recent declaration, the Government of Manchoukuo would seem to be well within its rights in acting upon his suggestion and advice in placing its case directly before the American people. Not that I believe any appeal for justice can now change the fixed policy of our Government as expressed in the Stimson Doctrine, but as these issues may lead the nation into war, it is well to keep the record straight, so the American people will understand what it is all about.

There was a time when the people and Government of Manchoukuo were eager to obtain outside sympathy and understanding, but they are no longer interested in what the world may think about how they achieved their independence. In making that statement, I do not wish to convey the impression that they are cynical or contemptuous of world opinion. They merely feel that they have been unjustly condemned in order to satisfy the exigencies of world politics and that no presentation of their case can now change the verdict of the League and the United States.

They hailed with satisfaction the appointment of the League Commission of Enquiry to investigate conditions on the ground and report the facts to the League Council. They were prepared to welcome and extend every facility to that Commission, but you can imagine the surprise of the Manchoukuo Authorities when they were informed that it would be accompanied by a Chinese Assessor who was the right-hand man of their deposed tyrant and by two of his most trusted foreign advisers. The Manchoukuo Government protested against the appointment of these men, but was curtly informed that unless they accompanied the Commission, it would not enter Manchuria. The Commission visited the country, seeking only the facts which fitted in with its preconceived views. The case was prejudged before the evidence was in.

As the people of Manchoukuo see it, this Fact-Finding Commission constituted itself into the Prosecution and reported its facts to a Grand Jury composed of itself. It then indicted Manchoukuo and transformed itself into a Court which tried the case on its own evidence, rendered its verdict and dissolved itself. Its work was finished. The Government of Manchoukuo very properly assumed that the League was the final court of appeal and sent its representatives to Geneva to rebut the findings of the Commission, but found that the case was closed. There was no appeal from the verdict of the Commission. Manchoukuo stood at the

bar of world justice, condemned and sentenced without an opportunity to present its side of the case. The verdict stands, and the sentence of the League, concurred in by the United States, is being carried out. Conscious of having committed no wrong, Manchoukuo faces its judges unabashed, unafraid, and accepts the verdict and its consequences. Confident in the righteousness of its cause, Manchoukuo will fight to the bitter end rather than surrender its right to liberty. The people of Manchoukuo will never again submit to the rule of the Chinese war-lords.



Cabinet Ministers of Manchoukuo

Left to Right: Messrs. Lo Shen (Secretary to the Premier), Chang Yen-ching, Minister of Industry; Hsieh Chieh-shih, Foreign Minister; Tsang Shih-yi, Minister of Civil Affairs; Cheng Hsiao-hsu, Premier and Minister of Education; Sun Chi-chang, Vice Minister of Finance; Chang Ching-hui, Minister of Defense; Ting Chieh-hsu, Minister of Communications; Feng Han-ching, Minister of Justice

A Question of Humanity

Let us examine some of the points on which the people of Manchoukuo rest their case. The doctrine of the territorial integrity of China under the administration of one Central Authority as embraced in the Nine Power Treaty may have been politically sound when the Treaty was signed, but from the viewpoint of humanity it has developed into the most immoral and wicked policy of modern times, handing over to one war-lord the right to consolidate his rule over the whole country by the sword. It is impossible to hold 500,000,000 people together under one government. It has never been done in the history of the world and cannot be done to-day. In order to give effect to this doctrine and unite China under one strong Central Government, more people have been butchered and proportionately more property destroyed in that country than during the World War. The slaughter still goes on. This subject requires a more lengthy exposition, but the mere statement is sufficient to understand why the people of any section of that vast country who can break away from this horror are eminently justified in doing so, even though they may violate some treaty or doctrine imposed upon them from without.

There are so many angles to the complicated problems solved by the establishment of the new State that the time at my disposal prohibits reference to all of them. I will, therefore, confine myself to what, in the opinion of the people of Manchoukuo, constitutes the basic principles involved. It may be true that the League Covenant, the Nine Power Treaty and the Peace Pacts were violated by Japan in resorting to self-defense to protect her interests in

Manchuria. That, however, remains a matter of opinion. Even the League Report hesitates to openly condemn Japan. But whether she did or did not, is no concern of the people of Manchoukuo. They are interested solely in their prerogatives as human beings to rebel against injustice, misrule and oppression and set up their own government. For years the huge armies of their bandit-overlords, numbering four hundred thousand men, made impossible any spontaneous revolt against their authority. Several independence movements had been quickly suppressed with ruthless cruelty. The people, sunk in despair, surrendered all hope of any escape from their misery.

The military intervention of Japan in defense of her own interests which, in two days broke the power of their tyrant and dispersed his armies, came as an Act of God, an answer to the prayers of the people for deliverance. Some Western peoples feel that they alone enjoy a monopoly of Divine favor. But the lowly Chinese and Manchurian farmer also believes that Heaven guards over him. Who will be bold enough to question the ways and workings of Providence? The power of Japan broke the shackles that held the thirty million people of Manchoukuo in servitude and set them free. The people of Manchoukuo accept it as a manifestation of Heaven in their affairs. The rest of the world may prefer to see the horns and forked tail of a Japanese Devil lurking in the background of the picture, but that does not change the fact that the people of Manchoukuo are now free. The League and the Government of the United States may believe what they wish, but the people of Manchoukuo are not looking a gift horse in the mouth. They contend that they had the same right to oust a tyrant and exercise the principle of self-determination which the Powers and "Succession States" of Europe appealed to in order to safeguard their own liberties and conception of security.

They have been told in so many words that they cannot exercise that right; that they must return to the rule of the Chinese war-lords and surrender their independence. They are told that their independence violates some of the international treaties and agreements upon which the world hopes to erect an edifice of lasting peace and justice; that those sacred and eternal principles of Humanity, Civilization and the right of a people to life, liberty and the pursuit of happiness, does not apply to them. They are told that principles which are good for the peoples of Europe and America cannot be extended to the peoples of Asia. For better or for worse, the people of what is called "China" must remain the slaves of their war-lords, until they themselves, without outside assistance, rise in spontaneous revolt to right their wrongs. Well, all these arguments leave the people of Manchoukuo cold.

President Wilson once said: "Democracy is not safe anywhere until it is safe everywhere." Our Nation entered the Great War to enforce this principle, which means, if it means anything at all, that any community has the right to alter its government when found to be oppressive. In every part of the modern world, political differences tending towards the disintegration of empires and states are being met and solved, not by the dispatch of armies to hold the people in subjection, but by recognition of the principle laid down by Woodrow Wilson as one of the bases of an enduring world peace. It is only necessary to point to the present composition of the British Empire as an example of how this new conception of statesmanship based on a sense of self-preservation, is working out. Yet, at the very moment when Ireland had carried its fight for absolute freedom to the point of refusing to give the oath of allegiance to King George, its representative at Geneva, officiating as President of the Council of the League of Nations, vehemently denied the same right to another people

living on the other side of the globe, because forsooth, their independence had been made possible by Japan's resort to force in defense of her own interests!

Is it a One-Way Rule?

The question might be asked: "Could Ireland have won her freedom without the financial support of the Irish in the United States, the sympathy of the American people and a rigid non-interference on the part of our authorities in their revolutionary activities?" Was it not the same with Cuba? Did not the Cubans establish the headquarters of their Revolutionary Junta in New York City, openly enlist recruits for their armies, raise loans, purchase arms and munitions and fit out filibustering expeditions to land these cargoes on the coast of Cuba? Did the Federal Authorities ever make any more than a perfunctory move to put a stop to these flagrant violations of the neutrality laws?

Was there any difference in principle between these activities and the fitting out of Confederate privateers in British ports during our civil war?

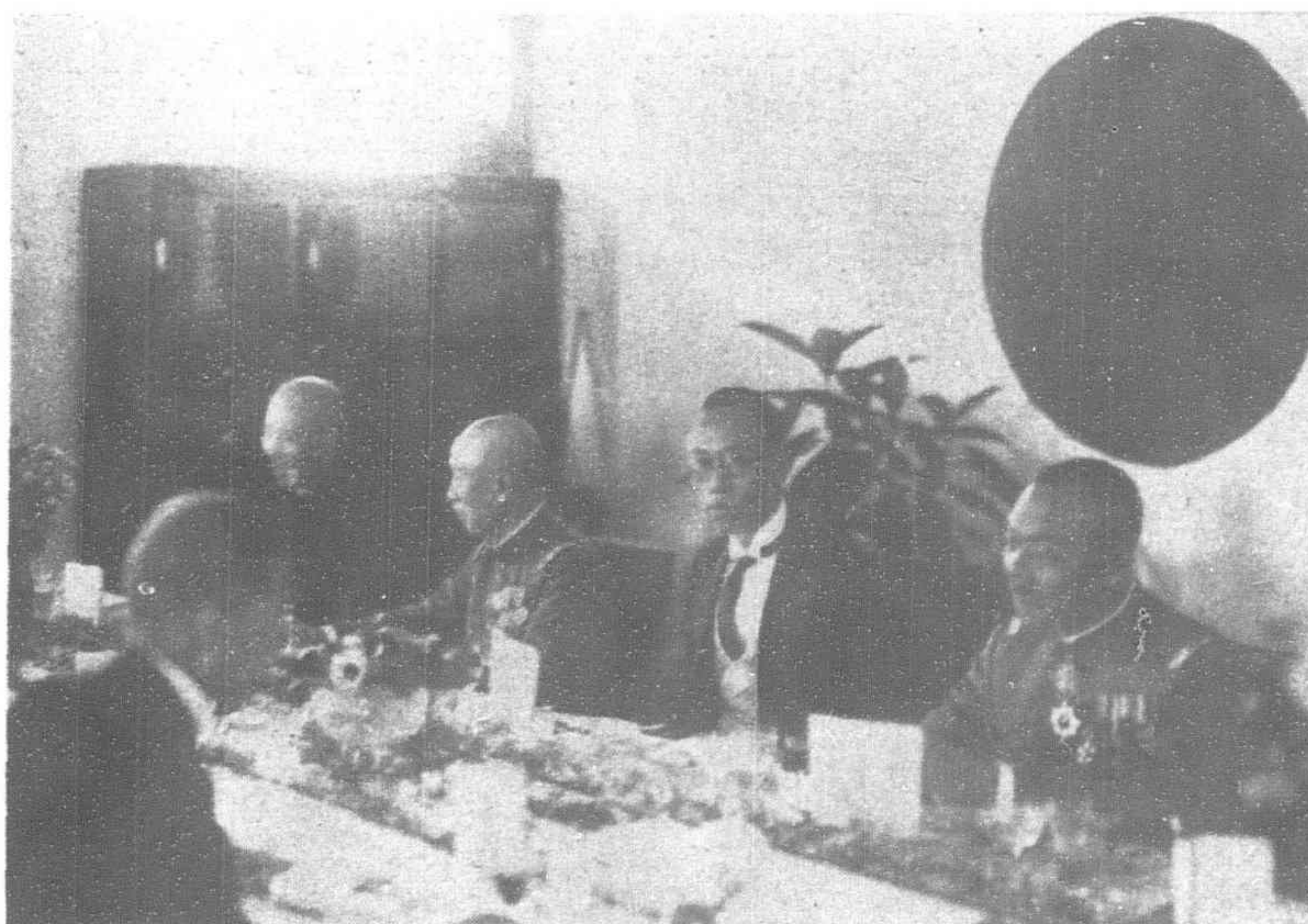
Let us apply the argument to the Far East. Japanese liberals extended hospitality, sympathy and financial support to Dr. Sun Yat-sen. For years, the Japanese authorities closed their eyes to the activities of the Chinese revolutionary group which made Tokyo its headquarters. There was no outcry at that time that the Japanese Government was breaking the laws of neutrality. But, when other Japanese lovers of liberty extend a helping hand to the oppressed slaves of Manchoukuo, the whole world holds their Government responsible for their acts, charging that their activities are all part of an official program for the conquest of China. The definition of self-

determination apparently is something that is good for Ireland, Cuba and many other Western peoples, but not good enough for the people of Manchoukuo.

The first requisite for self-determination is that the principle shall express the wishes and will of a majority of the people. You are told by the League Commission that of the 30,000,000 inhabitants of Manchoukuo, 28,000,000 are pure Chinese, who do not wish to be separated from their brothers south of the Wall. This statement is not borne out by the facts. Since 1910, not more than five million Chinese have emigrated to Manchuria and remained as **permanent settlers**. If we go back forty-five years to 1885, the total will not exceed seven million. This leaves 21,000,000 to be accounted for. **Who are these people? Where did they come from?**

These people are the descendants of the Bannermen, sons of the soil, born in the state, the legitimate heirs to the patrimony handed down by their forebears. Instead of an overwhelming Chinese majority, investigation shows that at least seventy-five per cent are natives of the country. Although a fair percentage of these may be able to trace their ancestry back to China Proper, their fathers forfeited the right to Chinese nationality when they entered Manchuria and accepted the Manchu regulations which, for all practical purposes, were equivalent to our own immigration and naturalization laws. If it can be proven that a majority of the population is not Chinese, but pure Manchurians, then the argument in support of their right to self-determination and independence requires no further elucidation.

The League Commission reported that it had received 1,500 letters from people in Manchoukuo protesting against the independence movement, but investigation disclosed that the majority of these letters were written by the students of the North-eastern University at Mukden at the command of Chang Hsueh-liang. There exists no machinery in China for ascertaining the will of



Scene at Luncheon

In honor of the late General Nobuyoshi Muto by His Excellency Mr. Pu Yi following signing of the Manchoukuo-Japan Protocol. Left to Right: Premier Cheng Hsiao-hsu, General Muto, Chief Executive Pu Yi and Lt.-General K. Keiso, Chief-of-Staff to General Muto

wishes of its people. Delegates to so-called national conventions and conferences are chosen by the chambers of commerce, guilds, and other public bodies. When the Government of Manchoukuo translated and circulated the report of the League Commission of Enquiry to the people, it was flooded with telegrams and letters of protest from every public body in the State. Many of these were telegraphed direct to Geneva and in due time were followed by the originals of 580 letters of protest, signed and sealed by the responsible officials of these organizations.

Thousands of similar communications from private individuals and firms were also received by the Manchoukuo authorities and deposited in the archives of the Government. Yet this overwhelming and convincing evidence of the desire of the people for independence was thrown out. The League did not dare reopen the case and admit testimony which refuted the findings and recommendations of its Commission. If that be Justice, then God help any other nation or people who may appeal to the Tribunal of the League against an unjust verdict.

But, whether the people of Manchoukuo are Manchus, Mongols or Chinese, or a composite type evolved through three centuries of exclusive intermarriage between the three classes of Bannermen, they will defend by every means within their power their right to secede from a system which enslaved, outraged and denied to them their fundamental rights as human beings. They contend, and rightly so, that there are no covenants, treaties, conventions, policies or doctrines that can deprive them of these rights and, that they are clearly within the law in declaring their independence of the chaos recognized by the foreign Powers as the Government of the Republic of China.

They are told that the world cannot recognize that independence because it was made possible through the application of force on the part of Japan in defense of her own interests. The people of Manchoukuo do not deny that this military intervention created the opportunity for them to set up their own government but they ask: is that an infraction of the treaties or a violation of international law? The Japanese forces did not invade Manchuria. They were already there, 11,000 of them, protecting a railway under the provisions of a treaty conceding that right in the same way that forces of the Powers patrol the railway from Peking to Shanhaikwan in order to guarantee to the Legations a free access to the sea, that is, a quick and easy way of escape should the Chinese repeat their madness of 1900. Should another anti-foreign or Communist movement in the north compel these troops to take over the operation of the Peking-Shanhaikwan Railway and, in the uncertainty and confusion that would follow, the local civil officials should desert their posts, the situation would be identical with what happened in Mukden on the night of September 18, 1931. In such a contingency, the Allied High Command would either have to assume immediate responsibility for the maintenance of law and order, or encourage responsible Chinese to take that burden off their shoulders and support them in the discharge of their duties. The day may arrive when such a situation may be precipitated and the Powers may also find that the people of North China will prefer their independence rather than submit to some Sovietized Southern war-lord.

Some Pertinent Aspects

The people of Manchoukuo acknowledge the assistance rendered by the Japanese army in creating the opportunity for them to shake off their shackles. If that be a crime, or a violation of treaties, they retort that every people who have achieved their independence have done so with help from the outside. They ask: "Could the United States have won its independence without the aid of France? Could the Cubans have emerged triumphant from their five-year struggle for liberty without the timely aid of the United States? Could the other Latin American states have preserved their independence without the protective guarantee of the Monroe Doctrine? Does not this Doctrine (even in its latest interpretation) still stand as their one security against outside aggression? How did the post-war states of Europe achieve their independence? Carved out of the old Central Powers, Turkey and Russia, in order to safeguard the security and peace of Western Europe, the people

of these states were permitted to exercise their right of self-determination and establish themselves as going concerns under the protection of the League of Nations. And, it is well to remember that this remaking of the map of Europe, this major operation of slicing large chunks from the territories of the vanquished foes, was carried out by an American President confident in his ability to reform the world and create a new international order.

Let me apply the principle to China. Mongolia is an independent republic set up by Russia and incorporated into the Soviet system. The Powers uttered no word of protest against this violation of China's territorial integrity. In 1925, Canton declared its independence of Peking and entered into an alliance with Moscow, not for the purpose of defending its independence, but for extending its rule over all China. When the Nationalist armies triumphed and set up their Government, first in Hankow and then in Nanking, the Powers recognized the accomplished fact. Whatever Soviet Russia does in China seems to be within the law, but when the people of Manchoukuo take advantage of the opportunity presented by Japan's resort to self-defense, to declare their independence and enter into an alliance with Japan for mutual defense against a menace that looms just over their borders,

the whole world condemns them and the machinery is set in motion to segregate them, penalize them and force them to return to the yoke of a Chinese war lord who cannot establish his rule over his own bailiwick.

What was good for the Mongols when done by Soviet Russia is bad for their next door neighbors and blood-brothers when done by Japan. There is no logic in such arguments, nothing but cold unreasoning prejudice, revealing a determination to block Japan at all hazards, holding her fast to treaties while Russia and China are permitted all the time necessary to prepare for her undoing. We are witnessing in the Far East a life and death struggle between two mighty forces, a fight for existence between the Mongol and the Slav and it ill becomes us as a nation to strengthen one side against the other by a too exacting compliance with treaties that should never have been signed in the first place and which should long ago have been revised.



H.E. The Premier of Manchoukuo Cheng Hsiao-hsu

The Keynote of His Character and His Aims is given in a sentence from one of his essays. He said, "Men of ability and virtue to-day voluntarily must apply their ambitions to a singleness of purpose—Good Government"

Is the Nine Power Treaty different from any other formal agreement or compact between nations? If our contracts with other nations can be revised in order to meet the ability to pay off our debtors: if these debtors default on their payments because they need the funds for increased security and we continue to treat them as friends; how can we judge too harshly another good friend who resorts to self-defense in seeming violation of a Peace Pact which recognizes her right to do so and to define that right? Changing conditions in Europe have been advanced by our debtors to excuse defaulting on their contracts with the United States, but we will not admit that changing conditions in Asia and the imperative need of Japan to defend herself against the menace of these conditions, justifies her in defaulting on her political contract with us. On the other hand, Japan is the only nation in the world to-day that has never defaulted on her promise to pay. Is this a dishonest nation? If her bond is good in financial matters, can she not also be trusted to keep her political pledges?

We overlook this admirable quality and profess to believe that in some way she has violated another pledge which has nothing whatsoever to do with our own vital interests, but concerns a nation that should be able to take care of itself and which would long ago have compounded amicably its differences with Japan had the League and the United States not intervened in the dispute. To gain international support for our viewpoint, we rushed into the arms of those who have violated their financial bond and solicited their co-operation against the political defaulter!

Stripped of superfluous verbiage, our attitude reveals that we are determined to hold Japan to the terms of treaties and covenants not binding upon Soviet Russia. We accept without question the Chinese forged "Tanaka Memorial" purporting to outline a program for the Japanese conquest of Asia, overlooking that even if authentic, the plan revealed was justified as an answer to the Soviet doctrine of World Revolution, which, notwithstanding all reports to the contrary, remains the basic policy of Communist Russia. The whole world has an exact knowledge of Communist aims and aspirations and every sensible government has taken measures to defend itself against this menace.

The Record of the Reds

The world has watched the gradual spread of Communism and seen its disruptive working in every country where its doctrines have taken root. We have seen how it secured a foothold in China and converted the Yangtze Valley into a shambles. We are now witnessing a life and death struggle between the Nanking Government and the Communist armies led by fanatics trained in Moscow for this purpose, yet when Japan makes a move to protect herself against the spread of this movement, Moscow loudly proclaims that Japan is preparing for a war of aggression! The world is being brought face to face with another crisis in which the nation employing force to defend its existence and its system of government will be judged and condemned as the aggressor, while the nation whose conquests are advanced by the spread of its subversive doctrines will be absolved of all wrong.



Mr. Hsieh Chieh-shih, Minister of Foreign Affairs of Manchoukuo

"The State of Manchoukuo," he said at the time the Manchoukuo-Japan Protocol was signed, "Came into being through the will of the inhabitants of this region, and is set to strive for the promotion of the People's welfare within and for the maintenance of friendly relations with Foreign Countries without"

The Pacts outlawing war as an instrument of national policy left the road wide open for China to employ economic pressure to enforce her diplomacy and there was no redress, even by appealing to the League. As a consequence, the world witnessed the Manchurian and Shanghai incidents, in which Japan was condemned as the aggressor, while China, the provoker, became the innocent and injured victim! The failure to define aggression will soon precipitate another world crisis. The Soviet Government, the Third International, or the Central Committee of the Communist Party (the names are interchangeable), has a fixed and unalterable program for the domination of Asia. Slowly, but steadily, Communist agents are silently extending their spheres of influence, inciting the peoples to rise against their rulers. With an army of over a million and a quarter men, Moscow preaches peace, enters feverishly into non-aggression pacts, proclaims her readiness to disarm and broadcasts her definition of the "aggressor." And the world, especially the unsophisticated American pacifist, laps up the Communist pap and acclaims the Soviet as their allies in the movement for world peace. These peace-loving Americans however overlook that aggressive imperialism does not always take the form of armed conquest or economic penetration. The same result may be attained by propaganda inciting peoples to overthrow their governments.

For the past fifteen years Soviet policy has disturbed the internal peace, stability and the institutions of every country in the world. Barred by a watchful Poland and the states of the Little Entente from penetrating Western Europe, the Third International launched the campaign to bring Asia under its sway. Step by step the Soviet frontiers and influence have been pushed forward, until it became apparent that the end of the First Five Year Plan would see her impregably entrenched in Central Asia with China and India at her mercy. Had not Japan moved to protect herself while there was yet time to do so, the Red would now be ruling Nanking and Canton. In one short year the whole strategic picture in Asia was changed.

When the Japanese pacified Northern Manchuria and pushed through to completion the railway from Hailun to Rashin, the road was open to transport their armies in motor vehicles from Harbin to Blagoveschensk within forty-eight hours, seizing and cutting the Amur Railway at that point, isolating Vladivostok, and the Primorsk from the rest of Siberia. When the Japanese and Manchoukuo armies occupied Jehol, they placed themselves astride the road from Urga to Kalgan, the line of advance the Soviet relied upon to rush their troops into North China and flank Japan's position in South Manchuria. When Moscow awoke to the realities, she found herself checked on all fronts in Eastern Asia, menaced with the loss of her maritime provinces, and all the territory east of Baikal. Then, and only then, did Communism realize that its dream of World Revolution was over.

This will help to explain Moscow's otherwise inexplicable gesture to dispose of the Chinese Eastern Railway: why she placed the purchase price so high as to compel its rejection by Manchoukuo, and why the negotiations were permitted to drag along until a deadlock was reached. It gave Moscow added time to strengthen her position, which she utilized by feverishly negotiating

non-aggression pacts with her European neighbors and holding out inducements to win the friendship of the Capitalist Powers she had derided and flouted in the past. Litvinoff was dispatched to London to dangle before the Economic Conference the lure of rich concessions, fat contracts and billions of dollars in orders for materials. Hungry for business, the United States jumped at the bait.

Litvinoff played his catch and found at the end of his line a whopping big electric eel, which took ten days to reel in, unhook and force into his basket instead of the pleasant half hour's sport so joyously anticipated. He even lost his little Red Shirt in the tussle. To obtain American recognition and promise of financial credits that would help the Soviet to push forward its preparations against Japan, Litvinoff was compelled to renounce and repudiate the very essence of Communism by throwing overboard the Third International. With American recognition, Moscow's attitude towards Japan immediately stiffened but the announcement that the American fleet would be withdrawn from the Pacific, clearly indicated that Washington had no intention of being drawn into any conflict in Asia. The American press followed this up by declaring that recognition did not imply alliance and that under no circumstances would the United States take sides in such a war. The eel had slipped out of the basket. Bewildered, Moscow frantically began to seek allies amongst the capitalist nations of Europe but it is evident that no Power will support her in such an emergency. Understanding that her dream of World Conquest is over, Moscow now announces a willingness to reshape her foreign policies and work in close collaboration with the League of Nations and other Peace organizations in order to gain sympathy and friends in the event of a showdown with Japan. **Soviet Russia is now a pacifist nation. She has abandoned—for the moment—her program for World Revolution, but it is well to remember that it took Japan to call her bluff, and American diplomacy to strip her of her power to cause further trouble in the world.** It is also well to keep always in mind that Moscow no longer has to employ her own armies to advance Communism in Asia. The Main Red Army is needed at home to keep the Russian people in subjection. The Red hordes of China led by Soviet-trained militarists are fighting Moscow's battles in the Far East. If they win, Communism triumphs

A Carmine Outlook in Asia

Let us look at the picture of Asia as it is to-day. Mongolia is a Soviet Republic closed to foreign trade, travel and residence. No foreigner can enter the country to investigate what is going on behind the screen, but we know that there exists a Mongol force of 75,000 men drilled to a high state of efficiency by officers of the Soviet Army. Chinese Turkestan is only nominally a part of China. It belongs to the Soviet economic sphere, and it is only a question of time when it will gravitate into the Soviet political system. Central China is a congeries of Soviet republics.

The Main Chinese Soviet Republic with its capital at Juiking in Kiangsi Province has been in existence for five years. Repeated major military campaigns directed by Generalissimo Chiang Kai-shek in person have failed to suppress it. It issues its own money

and postage stamps. It is entirely self-contained except for salt which is smuggled in. It rules 6,500,000 people in Kiangsi alone and boasts an army of 70,000 well equipped and uniformed troops. All it needs is a sea port in Fukien through which to import arms and munitions and consolidate its position and power (It is significant that the recent independence movement in Fukien synchronized with the American Government's invitation to Moscow to discuss the terms of recognition). Several other similar Soviet republics are scattered throughout the length and breadth of the Yangtze Valley. Suppressed in one place, the Red armies locate in some other district and start afresh. Wherever they go, merchants, landowners and capitalists are ruthlessly butchered and the land re-distributed to the peasants. Young men and women trained in Moscow for this special purpose are appointed by the Central Executive Council of the Communist Party in China to educate and train the people in the tenets and working of the Communist faith. The emblem of the hammer and sickle has supplanted the Kuomintang sun on banners, stamps and seals of the Republic. The Communist revolution in Russia with all its horrors is being re-enacted in China.

Every day the menace grows. Unless Chiang Kai-shek succeeds in suppressing the movement, the Reds will dominate the Yangtze Valley. Canton or South China and now Fukien, are independent. Its leaders are so far to the Left as to be in the Communist camp. They have never forgiven Chiang Kai-shek for betraying them after they had conquered Central China and set up their Communist Government at Hankow. At the first sign that Chiang is weakening, they will line up with the Communists and re-establish their hold on the government. No matter how camouflaged, that government will be Red, and the combined armies of the Yangtze and South China, numbering nearly two million men, will be free to turn their attention to North China and Manchoukuo. Across the border of Manchoukuo is garrisoned the Soviet Far Eastern Red Army of 250,000 men, the vanguard of the main Red force of a million men in European Russia. Should Chiang Kai-shek be defeated and the Communist hordes of Central China move north, the Mongol army and Far Eastern Red divisions will

march in unison and the jaws of the Communist nut-cracker will close on Manchoukuo and North China.

You may think this is an extravagant picture. It is not. The Cantonese and the Reds have combined in Fukien to overthrow Chiang. It requires no prophet to foresee what will happen should the Nanking Government collapse. The full weight of the new Nationalist-Red armies will then be thrown in the field to subjugate North China. By that time Soviet Russia will have strengthened her position in Siberia and the pressure of Communist opinion will compel the government to support their Comrades in China. The emphasis of the **Comintern** manifesto this year, as reported from Moscow, is on the strengthening of the Communist party in China to resist the Japanese. The picture is not overdrawn. The menace is there. The possibility of huge American credits to Soviet Russia, the establishment of American aircraft plants in Russia and China, combined with the Soviet's aerial concentration in the Far East, China's air program, and other indications, leaves no doubt as to what the future portends in that



General Chang Ching-hui. Minister of Defense of Manchoukuo

He is an example of the type of Manchurian Warrior who can be depended upon to lead its Armies in the event the Nation is attacked

part of the world. Do you wonder that Japan is uneasy and jumpy? She sees that she may again have to stake her existence on the plains of Manchuria, with public opinion throughout the world marshalled against her.

The only barrier between Communism and its domination of Eastern Asia is the buffer state of Manchoukuo allied with Japan to ward off this menace to their existence. As to whether Manchoukuo and Japan are justified or not in combining to defend themselves, is a matter which does not concern any other nation. As to Manchoukuo, its people prefer to live their lives under a system of government they understand rather than come under a rule that is as loathsome and abhorrent to them as it is to the people of the United States. Communism at home in Russia and in China does not take the form of a war of ideals, but achieves its supremacy by ruthless massacre. The people of Manchoukuo can see how it works just across the border. Thousands of refugees slip into their territory to escape death at the hands of their Red taskmasters in Siberia. Under the old régime, these poor unfortunates were rounded up by Chinese bandit generals and returned to their executioners at so much per head.

The people of Manchoukuo can see with their own eyes the starvation, misery and human degradation that stalks just across their borders; they know what has happened in Central China where whole cities, towns and villages have been looted and given to the flames, their inhabitants, men, women and children slaughtered, and the young girls led away to satisfy the lusts of the soldiery. They know what Communism in Asia means, and are determined to defend themselves against any attempt to implant the doctrines in their territory. So, altogether apart from the basic principles involved, there are other excellent reasons which justify the creation of the new State.

Why Tutelage Is Necessary

We are told that Manchoukuo is not an independent state, that it is merely a puppet of Japan; that in due course Japan will annex the country the same as she did Korea. The process of reasoning seems to be that Japan will set up a constitutional Monarchy under the rulership of Mr. Henry Pu Yi, and, when the time is ripe, compel her "puppet" to sign a decree of annexation in order to legalize her "conquest." Many of my newspaper colleagues who have visited Manchoukuo come away with this impression, which clearly indicates that they went there, not with an open mind, but with preconceived ideas absorbed through contacts in Peking or Shanghai and reading Chinese propaganda. My answer to this is very simple. Anybody with a knowledge of China knows that the only conception the modern Chinese have of government is to divert all the revenues into their own pockets. The old virtues of the race have disappeared, and it will take many decades to educate them in the rudiments of honest government. Unless competent and conscientious officials supervise the collection and expenditure of the revenues, there will be no government and Manchoukuo will slip back into the morass of corruption from which it was extricated.

The question arises: how long will it take the Japanese to teach these people the rudiments of good government; how long

will it be before their controls can be withdrawn and complete administrative independence handed over to the Manchurians? I can only answer this by comparing American methods in the Philippines with the similar experiment the Japanese are trying out in Manchoukuo. When we took possession of the Philippines, we said in effect to the Filipinos: "You people are not competent to govern yourselves; you cannot be set adrift to become the prey of other Powers; you must remain under our tutelage until such time as, in our opinion, you have arrived at that stage where you can be safely granted your complete independence." Notwithstanding that a majority of the Filipinos have a background of four centuries of Spanish culture and have embraced Christianity, after thirty years of schooling in American ideals and self-government, we refuse to admit that they have progressed to the point where they can be left to work out their own salvation. It is true that we are to concede independence to the Islands, not because we believe we have discharged our duty or that the Filipinos

are competent to govern themselves, but because our home agricultural interests have demanded this as a protection for their products. The open letter of Secretary Stimson to Senator Borah on the reasons why we should hold on to the Islands is perhaps the most imperialistic document ever penned by an American statesman. Analyzed, his letter says that we must keep the Filipinos in subjection, in order to retain a naval base in the Far East to uphold the principles of the Open Door and the integrity of China. Secretary Stimson would subordinate our political ideals and the independence of the Filipinos to our commercial interests in China and the enforcement of policies and treaties designed to preserve intact the territorial integrity of that country. Not against Russia, mind you (she has *carte blanche* to do as she pleases in Asia), but against some other Power not mentioned, but whose identity is not difficult to arrive at by a process of elimination.

Now look at Manchoukuo. Japan says to the people of that country: "We recognize your independence and stand ready to enter into an alliance with you to safeguard our mutual interests." But, like the United States in the Philippines, she also says: "You are incapable of self-government; you have not the first conception of what self-government means or the first qualification for its

exercise; you must accept our assistance to establish a proper government and teach you to run it so that in due time you will develop into a strong, self-contained state, competent to discharge your end of our mutual bargain." There is no ambiguity about Japan's declaration of intentions. She starts out by a full and frank recognition of Manchoukuo's independence and sovereignty. That question is forever removed as an issue between the two peoples.

The real question is: how long will it take to educate the people of Manchoukuo to govern themselves? That seems to be a matter which concerns only the people of Manchoukuo. As long as they are satisfied, no other nation has the right to interfere. Certainly, the last people in the world to prejudice Japan, question her good faith or impugn her motives are the people of this country. It may take one, two or more decades, before Japan can safely withdraw her political, economic and financial advisers from Manchoukuo



General S. Honjo

who was Commander-in-Chief of the Kwantung Army when the Crisis in Manchuria developed. He was promoted to a position close to the Person of the Japanese Emperor and on his departure from Manchuria he said, "The Manchurian issue is a settlement of accounts handed down by the two past Wars in Manchuria"



The Late Field-Marshal Baron Nobuyoshi Muto

Who was the first Japanese Ambassador to Manchoukuo and whose death occurred there in August, 1933. "When the Powers Come by the Truths," he said in an address at the time he took over Command of the Kwantung Army, "they may be expected to compliment us upon our enterprise"



General Taksahi Hishikari

Who became Japanese Ambassador to Manchoukuo and took over Command of the Kwantung Army in the Fall of 1933 expressed his views in an address at Mukden at that time. "In Order to enable this new State to achieve its Crowning Glory," he said, "I firmly believe that harmony and co-operation are needed between the peoples of Japan and Manchoukuo"

and, even when full administrative independence is conceded, Japan can never completely surrender with safety that military supervision and co-operation upon which rests the vital strategic security of both nations.

Making Altruism Pay

If you will read the many speeches delivered during the Senate session of 1900 which fixed the policy of the American Government towards the Philippines, you will learn that pure altruism decided us to assume unasked the burden of educating and uplifting the Filipinos to the point where they would be competent to govern themselves. This "divine mission" has since been expanded into an imperialistic doctrine which calls for the retention of the Islands in order that we may possess a base to enforce respect for the Nine Power Treaty, that is, the Open Door and the Territorial Integrity of China. The Filipinos must forego their independence in order to guarantee the territorial integrity of 500,000,000 Chinese whose disorganization invites intervention in their affairs. There is no altruism in what Japan has done in Manchoukuo. Sheer necessity, the instinct of self-preservation, has influenced Japan in demanding that Manchoukuo place its house in order and discharge its fundamental duties to its own people and its international obligation to defend itself against a menace that has already dismembered China and threatens to dominate the whole country.

Does this mean that Manchoukuo is and will always remain a "puppet" state? Just what is a puppet state? How long would certain states of Europe survive without the powerful and determined backing of France? How long would any of the Latin American republics endure after the Monroe Doctrine no longer affords them protection? The only right that Nanking has to rule over all China is the recognition and financial support of the Powers. Withdraw that recognition and the government

at Nanking will collapse like a house of cards and China would split up into four or five independent states. For thirty years I have watched the gradual disintegration of what was once the Chinese Empire and I do not hesitate to state that it has been preserved from breaking up into its component parts by the operation of the Hay Doctrine and the support of American diplomacy which finally wrote the principle of the territorial integrity of China into the Nine Power Treaty.

At all times, the American Government has stood guard over China. Our diplomats and publicists have encouraged the Chinese to believe that under certain conditions the United States would go to war in defense of that principle, until their leaders now openly declare that we are in honor obligated to fight their battles for them. Take away from Nanking the assurance of American support and the fiction of the integrity and unity of China would disappear. So what do we mean by a puppet state? If Manchoukuo is a puppet, so is Nanking; so are many other countries whose independence is guaranteed by stronger Powers in order that they may serve as buffers against a hypothetical enemy. This principle, invoked by other great Powers for their security, is all that binds Japan and Manchoukuo together.

Manchoukuo looks forward with hope and confidence that under Japanese tutelage it will make rapid advances toward the goal of good government and the day will arrive when the people will demand an abatement of Japanese supervision and intervention in their internal affairs. Human nature is very much the same the world over. Experience teaches us that it is futile to expect gratitude from any people for merely bettering their conditions. For the moment, the people of Manchoukuo are deeply grateful and appreciative of the support and assistance extended to them by Japan, but as the years go by and the country becomes stabilized and prosperous, as the revenues increase and the budget is doubled and trebled, the people of Manchoukuo will not be

happy until they are conceded a larger control over their own affairs. It is safe to predict that Japan will gradually hand over full control to the Government of Manchoukuo and confine her intervention to co-operation in basic strategic measures for mutual defense.

In other words, the Protocol between Manchoukuo and Japan is, for all practical purposes, a Far Eastern application of the Platt Amendment, recognizing the treaty rights and interests of Japan in Manchoukuo; providing for military co-operation in the maintenance of peace and national security and conceding to Japan the right to station troops in Manchoukuo for this purpose. As long as the Stimson Doctrine holds out the inducement to Chinese war-lords to re-establish their rule over Manchoukuo and the Third International adheres to its program to Communize and dominate Asia, the security of the new State is menaced from three sides.

Should Manchoukuo go under, Japan's existence would be automatically imperilled. Self-preservation has therefore brought these two nations together for mutual defense. Japan's right to station troops in Manchoukuo is paralleled by American policy in Cuba, where, because the strategic problems envisage aggression from overseas, the United States maintains a naval base instead of an army post. Although the United States might with perfect safety revise the Platt Amendment and surrender her right to intervene in the internal affairs of Cuba for the maintenance of a government adequate for the protection of life, property and individual liberty, Japan is so placed that she must insist upon the right to intervene in the internal affairs of Manchoukuo until such time as a strong, self-contained native government can perpetuate itself. Prosperity, internal peace and stability may not always satisfy Manchoukuo, but when to these blessings are added a security that Japan alone can guarantee, there is reason to believe that the people of that country will not resent or seek to terminate by force Japan's benevolent intervention in their affairs. The day will come when Manchoukuo will be able to stand alone. The Protocol with Japan will then reduce itself to an ordinary alliance for mutual defense between two sovereign states.

Japan's True Objectives

Before I accepted the invitation to come to America for the Government of Manchoukuo, I made my own investigations as to the true objectives of Japanese policy in that country. I could not consistently or conscientiously accept a mission on behalf of Manchoukuo, feeling in my heart that Japan intended to annex the country. Although I could find good and sufficient arguments to support Japan in such a policy, I am retained by the Government of Manchoukuo to present and defend its case and cause. If I am now in Washington as Counsellor for Manchoukuo, it is because I am satisfied and confident that Japan will faithfully comply with her pledges. But before arriving at this conclusion, I talked with all the leaders of the Japanese Government, including the War Minister, General Araki. Perhaps the most emphatic and concise declaration of Japan's intentions are found in General Hishikari's statement in Tokyo as he was leaving for his new post as Japanese Ambassador at Hsinking. He said: "The basic

and unswerving policy of Japan in Manchoukuo is a most scrupulous respect for the independence and sovereignty of that country." These few words reflect exactly what all the other leaders said to me in more lengthy conversations. I have full faith and trust in this statement.

From what I have already said and from what leading Japanese have stated on many occasions, you will sense that the main interest of Japan in Manchoukuo is to create a buffer state that will guarantee to Manchoukuo, to Korea and to Japan their security against the advance of Communism. No matter what people in this or other countries think about Communism, the peoples of Manchoukuo, Korea and Japan are face to face with the menace, and they realize that some day they may have to fight for their right to exist. This belief is deep-rooted in the minds of the people of Japan. If and when that day arrives, and Japan once more has to stake her existence on the plains of Manchoukuo, she must be assured of the friendship, the good will, the trust and the confidence of the thirty million people of that country.

If Japan should make the mistake of treating these people as inferiors or as subjects to be exploited, she will gain their ill-will, their distrust and their enmity and, when the show-down comes, Japan will face a solid bloc of enemies on the mainland. Slavs, Chinese, Koreans and Manchurians would combine against her, and she would go down to defeat and pay in tears and sorrow for her mistakes. So, if only for reasons of self-preservation, Japan will carry out her pledges with Manchoukuo. We may believe Chinese propaganda that Japan is out for conquest, that she intends to overrun Asia, smash the United States and then conquer the world. This is fantastic; pure, unadulterated bunk, a repetition of propaganda methods so successfully employed to inflame world opinion against Germany. The Japanese are concerned solely with preserving their own independence and in establishing guarantees for their security.

Has Japan the right to defend herself against the "menace from the direction of Urga" by supporting and guaranteeing the independence of Manchoukuo? The League, after carefully erecting a *Cordon Sanitaire* to serve as a buffer between Western Europe and Bolshevik Russia, and the United States, safely protected by 5,000 miles of ocean from immediate contact with Communism, apparently

denies to Japan the right to establish similar guarantees for her own security against this danger. Russia may expand her frontiers in Asia and no Power voices a protest.

President Wilson, against the advice of his highest military advisers, even sent an American army into Siberia without authorization of Congress and without legal appropriation for its maintenance, in order to keep Japan from getting a slice of Russian territory agreed upon by the Allied Supreme War Council as compensation for her occupation of Vladivostok and keeping open the Trans-Siberian Railway. We were sensible enough to decline the proffered mandate over Armenia, where an American army would guarantee India against a Russian advance from this direction, but we cheerfully sent an expeditionary force into Siberia to preserve the territorial integrity of Soviet Russia and in so doing made Asia safe for Bolshevism. When in 1921, we followed this up by insisting



Count Uchida, Veteran Statesman

Who became Minister for Foreign Affairs in May, 1932, and was entrusted with the task of solving the Manchurian Problem. "The Japanese Government," he said in an address before the Diet in August of that year, "Are convinced that the recognition of this new state is the only means of stabilizing conditions in Manchuria and of establishing a condition of permanent peace in the Far East"

upon the cancellation of the Anglo-Japanese Alliance, the one effective check to Russia's program in Asia was removed. The world is now facing the consequences of this mistake.

The American Government frankly admits that it saved Eastern Siberia for Russia. After convincing himself of the truth of this carefully guarded state secret by reference to the documents on file in the State Department, Litvinoff publicly acknowledged the debt by cancelling that part of his Government's counter-claim against the United States for damages arising out of the dispatch of the American Expeditionary Force to Siberia. The official publication of this fact in the exchange of documents surrounding the recognition of Russia will be interpreted in Tokyo as an admission of American sympathy and friendship for Russia and in Moscow it will be hailed as tantamount to a Russo-American alliance or at least as an understanding to the effect that the United States will support the Soviet in the event of hostilities in Eastern Asia.

Russian Policies Unchanged

Yet for the last seventeen years, Russia's program has been recorded in the archives of the State Department. In the exchange of correspondence over the Siems-Carey Railway contracts in 1916, the Russian Minister in his note to Minister Reinsch at Peking said that it was Russia's "policy to treat Mongolia as a natural barrier against Chinese colonization movements in the direction of the Russian dominions, that the *status quo* in Mongolia; by which is meant the permanence of that country in a pastoral state with sparse population, was essential to the feeling of security of his country; therefore, his Government could not look with indifference upon any enterprise that would induce the development of Chinese colonization northward in Mongolia. These considerations constitute the background of the Russian policy of trying to exclude foreign capital from railways in the region affected."

Soviet Russia has carried the policy of its Czarist predecessors to its logical conclusion by inciting the Mongols to declare their independence of China and, when this was done, recognized and incorporated the New State into its system of Socialist Republics. If Russia has the right to protect herself against the pressure of Chinese colonization by creating a buffer state in Mongolia, then by the same logic, Japan is equally justified in erecting a barrier in Manchuria to defend herself against Communism. The United States did not marshal world opinion against Russia. We waited a reasonable time and then recognized her.

And in recognizing her, we have placed on record that at all times we have been her good friend, even to taxing the American people without their consent to send an army to Siberia to protect her against dismemberment. Yet the American President who dispatched this army to safeguard the territorial integrity of Russia in Asia when it seemed likely that Japan might be conceded a slice of Siberian territory at the Peace Conference as compensation for her keeping open the Trans-Siberian Railway, had no scruples about dismembering Russia in Europe in order to realize his own dream of a supernational world organization. The same American

President after declaring the Monroe Doctrine a part of the League Covenant when carried by a bare majority of the Committee of Thirteen, reversed his ruling when the principle of Racial Equality advanced by Japan was carried by a majority vote, and declared for unanimity.

These glaring inconsistencies in our diplomacy at Paris followed by our handling of the Washington Conference and capped by the Exclusion Law and Stimson Doctrine have convinced the Japanese that they can expect no sympathy or support from the West. If Japan is now determined to safeguard her own interests in her own way, who can blame her? No self-respecting, virile nation of fighting men will forever submit to being deprived of the fruits of their victories at the Conference table or remain bound by treaties which permits one Power to work its will in Asia and denies their right to defend themselves against what, rightly or wrongly, they deem a menace to their peace and happiness.

If, as you have been led to believe, Japan is influenced by mercenary motives, and intends to exploit the people and resources of Manchoukuo for the benefit of its own industry and trade, it will interest you to learn that the Japanese Military Authorities are firmly opposed to any such program. When I visited Manchoukuo last August, I heard from many Japanese business-men rather bitter criticisms directed against the Army's attitude. My observations convince me that the High Japanese Military Command in Manchoukuo has adopted the policy laid down by Mr. Taft when, as Governor-General of the Philippines, he enacted laws to curb the monopolistic tendencies of American business-men and to preserve the Islands from being overrun and exploited by our commercial adventurers. The Japanese Army is similarly determined that the Manchurians shall not be exploited while it is engaged in the task of pacifying and stabilizing the country.

I will not say anything about Cuba, other than that in my younger days I stood by the side of Gomez and Maceo in their most stubbornly fought battles with the Spanish troops. My whole heart and sympathy was with the Cuban cause, but I opposed American armed intervention, believing that the Cubans would be much better off if they gained their freedom

unaided. I have lived to see my prophecies come true. We liberated Cuba from Spain; granted her a qualified independence and then slowly riveted upon her the chains of economic slavery. I do not like to dwell upon the picture of Cuba to-day. Frankly, I do not believe that the so-called imperialists and capitalists of Japan (and I know them all personally) could make as many mistakes in Manchoukuo as we have done in Cuba. At any rate, if the present policy of the Japanese Army is any guide for the future, Manchoukuo has nothing to fear from Japanese exploitation. The Japanese Army has one object only in Manchoukuo and that is to lay a solid foundation for the future strategic security of the Empire. When its task is finished, it will withdraw and cease to meddle with the civilian government of the country.

Every nation in the world has adopted similar policies for defense, yet by common consent they deny to Japan the same



Viscount Makoto Saito, Prime Minister of Japan

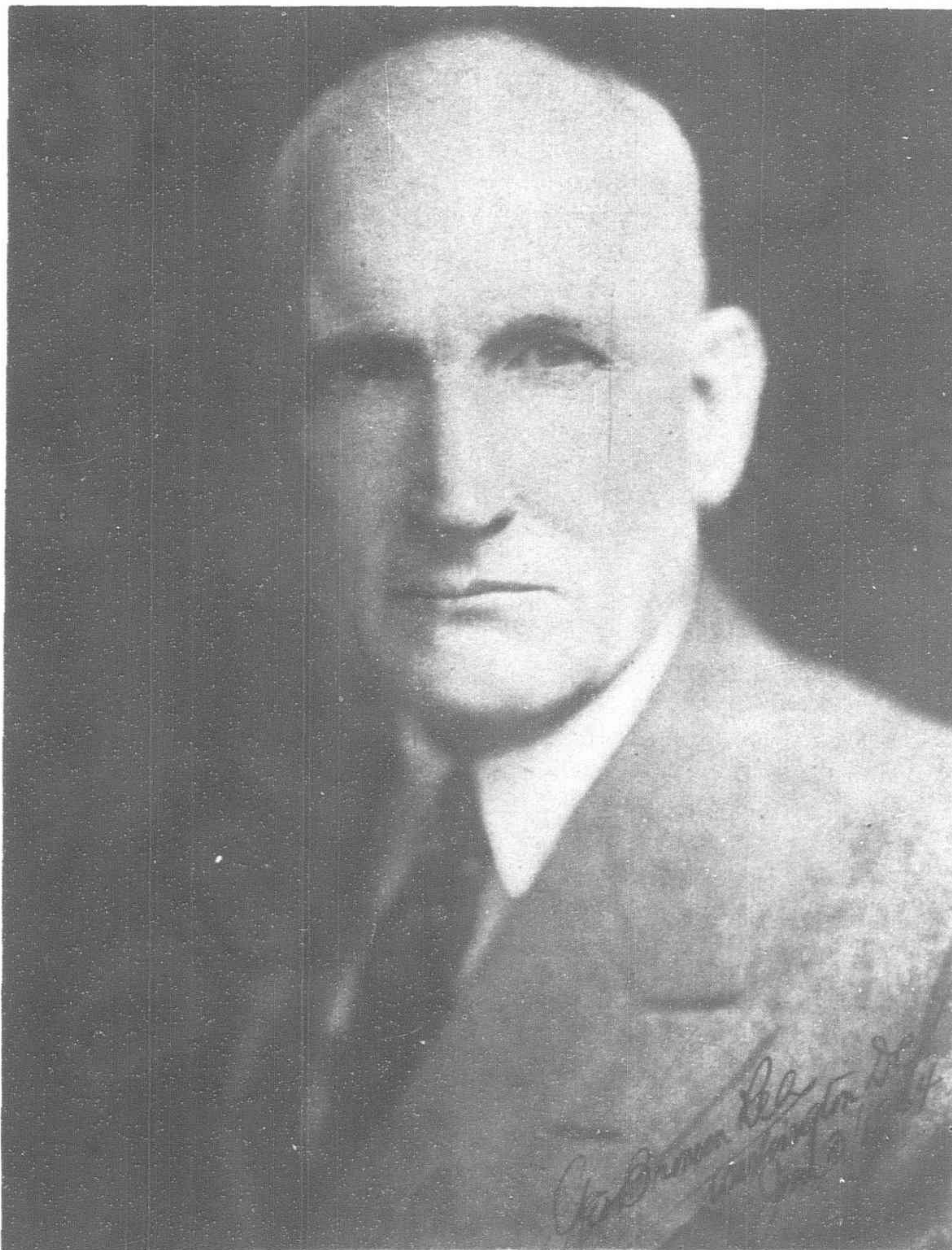
In an address on the subject of Foreign Policy in the Japanese Diet on January 21, 1933 he said, "The sturdy and healthy progress of Manchoukuo can well be taken as a concrete proof that the Government have not erred in their conviction that to recognize the new state and assist its development is the best way to arrive at a solution of the Manchurian Issue and to ensure the Permanence of Peace in the Far East and throughout the World"

right. Just across the Yellow Sea from Japan are Chinese armies numbering 2,500,000, with another 2,000,000 bandits and Communists roaming the countryside, living off the people. There are nearly 5,000,000 men carrying guns in China: double the number of the combined armies of all the nations of the world. Mongolia has a Red army of 75,000, while Soviet Russia has over 1,250,000 men under arms. Between six and seven million men are in arms in Asia, confronting Japan and Manchoukuo. If these armies combine and move against Japan, she may go down to defeat and become a little third rate Power taking orders from Moscow. Do you wonder then that Japan with her army of 230,000 is deeply concerned over what is happening in Asia. Perhaps you will now understand, as I did, why Japan must and will live up to her commitments in Manchoukuo and why that country will remain independent and be permitted to work out its salvation. Japan's very existence depends upon it.

The Fundamental Question

Although selfish reasons explain Japan's policy in Manchoukuo, her rulers also feel that they have a mission to restore law and order and good government in a territory they hold vital to their economic and strategic security. In carrying out this mission, Japan may have violated her treaties with other Powers. But whether she did or did not, is beside the question. Self-preservation is the first law of nature, and when man-made laws and treaties tend to deprive the individual or nation of the right to self-defense, the day will arrive when they will be subordinated to the primal code.

Japan's resort to self-defense has not resulted in the conquest or annexation of new territory. It has resulted simply in the creation of a new Chinese State that will determine its own future as it grows stronger and more able to take care of itself. Japan has not seized Manchoukuo. The 30,000,000 people of that country are independent and will fight to preserve their independence. If all these people are, as alleged, true, patriotic Chinese, bound to their brothers beyond the Wall in ties of a common culture and civilization, no power in the world can forever keep them apart. The day will come when order will be restored in China Proper and a new system of government will supplant the insensate struggle of war-lords for place, power and plunder. If there is to be a lasting peace in China, there must be some recognition of the rights of the provinces to complete independence of a foreign imposed central authority. It is too early to state what form of government will be evolved, but if the present trend is any indication, it may well result in a confederation of independent states held together by the same tenuous ties which now bind the parts of the British Empire to the Central Authority in London. Under similar conditions, the people of Manchoukuo might consider co-operating with their racial brothers south of the Wall, but they will never again submit to being ruled by any war-lord from Canton, Chekiang, Hopei, or any other section. Manchoukuo will retain its independence, not only from the rest of China, but **from Japan.** I repeat: Japan has definitely recognized this independence and will co-operate with Manchoukuo to defend and preserve it against danger from any quarter. I cannot leave this subject without a few words about the Chief Executive of the new State, Mr. Henry Pu Yi.



George Bronson Rea, Veteran American Publisher

Who is in Washington, D.C. and who holds the Post of Advisor to the Ministry of Foreign Affairs of the Government of Manchoukuo

The American press seems to delight in holding this young man up to ridicule. "Pooh! Pooh! Pu Yi!" is the title and theme of scores of American editorials on the ruler of the new State, conveying the impression that he is a "puppet," a "weakling," "the willing tool" of the Japanese, waiting to be crowned Emperor or King so that he can sign away his birthright and legalize Japan's so-called conquest of Manchoukuo. I have watched this young man grow from a baby to young manhood, and I know of no public character more deserving of sympathy. Pu Yi has tasted all the bitterness of life. Since able to understand things, he has lived in fear and trembling, never knowing what minute might be his last. At all times he has been the virtual prisoner of a "Republic" that callously violated the Abdication Agreements entered into in good faith on the part of the Manchus to avoid

plunging the country into the horrors of civil warfare. Since his forcible ejection from the Forbidden Palace by Feng Yuxiang, he has found refuge and safety in the compound of the Japanese Legation at Peking, and, after his departure from that haven, in the Japanese Concession at Tientsin.

Never physically strong or robust, this restraint on his liberty of movement and constant dread of assassination affected his general health, his disposition and outlook on life. He became "that poor young man," the butt of ridicule of the Chinese and foreign press. That young man is now free. He escaped from his prison and is now in his own country, the land of his Fathers. Surrounded by loyal Manchus and with a bodyguard composed in the main of the sons of Mongol princes, the old fear and trembling has been displaced by a feeling of security. The general effect upon his health and deportment has been remarkable. His eyes are clear, his handshake is firm and he looks physically fit. He plays tennis and rides horseback every day, developing a physical strength which, added to his splendid mental qualities has changed the "weakling" into a man the world will have to reckon with. Anyone who has had the privilege of a confidential

talk with Pu Yi must admit that he has a firm and intelligent grasp of the problems confronting the new State and that he looks forward to a career filled with great responsibilities.

Pu Yi is a highly educated, cultured and refined Oriental scholar and gentleman, with the traditions of rulership behind him and the blood of the best Emperors of China in his veins. On top of this, he has received a splendid English education under the tutorship of Sir Reginald Johnstone, the foremost British Sinologue. This young man is a hundred times better qualified to rule than any of the coolie or bandit generals the Powers have recognized as the Government of the "Republic of China." Although he may never be what the world calls a "strong man," there is every indication that he will develop into a wise, merciful and intelligent ruler.

A Figure to be Reckoned With

Pu Yi is not the puppet he is reported to be. He comes from sturdy stock. He will never sign away his birthright for a mess of pottage, no matter how much pressure may be brought to bear on him. I have confidence in that young man and believe that as the years roll by, he will command the attention and respect

now denied to him. We are told that he is held a prisoner, that he dares not move outside his quarters for fear of assassination. The truth about this, is that every precaution is taken to safeguard his person. His so-called "jailers" are all loyal to him and what he stands for. It is true that he is not seen publicly without a guard, but that is also true of every other ruler and general in China and applies to heads of state in other parts of the world. With the sole exception of Sun Yat-sen, no war-lord of republican China has dared to move around without a body-guard or an army at his back. The mob would tear him to pieces. In the case of Pu Yi, there are many adherents of the old bandit régime who would not hesitate to eliminate him from the picture.

After all, Pu Yi, whether he is called Chief Executive, Regent, King or Emperor, is merely a symbol, a rallying point for nationalism. The people of Manchoukuo and the Mongols look up to him as the "Son of Heaven." It may not conform to our Western ideals of democracy, but it will weld these people into a nation. Patriotism and nationalism takes many forms, but whatever they may be, if they bring law and order, respect for authority and stability of government, no other people have the right to complain, especially at a time when more advanced systems of government are crumbling before the onslaught of ideals which make for anarchy, revolution, dissolution and national decay.

Experts are now drafting a constitution for the new State. While I cannot assert with official knowledge what form the new government will take, I feel safe in predicting that it will be along the lines of a constitutional monarchy with Mr. Pu Yi as the ruler. Although I am a dyed-in-the-wool Jeffersonian Democrat, intensely loyal to American traditions, ideals and principles, my thirty years experience in Asia convinces me that it will take another century or so to educate the Asiatic in the rudiments of self-government as we understand it. I have furthermore become convinced that if there is to be a cessation to the slaughter that to date has characterized the movement to implant republican ideals in China, there must be an early return to some form of government more suited to the needs of the people. In plain words, I have reluctantly subordinated my political ideals and principles to the exigencies of Humanity and it is for that reason I stand here before you as the Advocate of Manchoukuo and why I cannot see eye to eye with the Far Eastern policy of our Government.

Any doctrine, policy, treaty or covenant which proclaims and upholds the right of any one war-lord to consolidate his authority by the sword over 500,000,000 people and which recognizes and finances his campaigns with the revenues derived from a foreign-supervised customs service, is fundamentally wrong, opposed to all those concepts of Civilization and Humanity upon which human progress is founded.

I repeat, that more people have been killed in these civil wars in China during the past twelve years than were killed in the World War, while the untold millions who have died of starvation, plague, floods and other calamities, all of which could have been averted by honest administration, far exceeds the civilian deaths of the Great War. Yet the world prates of peace and humanity. How long is this slaughter to continue? How long must the lowly, miserable, inarticulate Chinese farmer pray to his gods for deliverance? Poor, hungry people who turn to any leaders promising release from their misery, are being mowed down by machine-guns in order to perpetuate the rule of military overlords whose only conception of government is their own enrichment and whose right to rule and hold the people in subjection is derived from the recognition of the Powers and the weight of their armies. The cries of distress, of agony and human misery that in any other country or at any other time, would be heard throughout the civilized world, are drowned in the roar of political propaganda and the pronouncements of policies. The laws of Humanity do not extend to China.

Unfortified cities have been bombed, stormed, sacked, burned, and whole populations, men, old women and children, put to the sword and the bodies left for the dogs to devour. The young women and girls are carried off to be the slaves and playthings of the soldiers. The almost incredible barbarities, licentiousness and bestiality which mark the Communist advance and the anti-Communist drives in Central China have no parallel in modern history. The real truth about China is never told to a foreign audience. In all these years, you have not heard one pacifist, one League enthusiast, one outstanding philanthropist or humani-

tarian, one missionary or one spokesman for the common people of China denounce publicly these atrocities and high crimes against Humanity and Civilization. You have heard only from the spokesmen for the official minority who constitute the electorate and rulers of China, whose bullets, bayonets and bombs take the place of the vote in a country which claims to be a republic. The welter of their propaganda has drowned out the appeal that swell from the hearts of millions of human beings praying for some alleviation to their sufferings.

In stating the case for Manchoukuo, I am also speaking for these millions of China, who by our policies, we have delivered over to their oppressors. We can do little now to stop the march of events. The people of Central China have turned to Communism as their sole hope of deliverance from the yoke foreign diplomacy has fastened upon them. The Yangtze Valley will go Red. Canton and South China will join the movement, and a new government will supplant the régime at Nanking. The Nationalist-Red armies of over two million men will then be free to advance upon North China and Manchoukuo, and the story of wholesale massacres, looting, burning and destruction will again fill the front pages of our newspapers. Whether Manchoukuo will survive or not is problematical. It will fight to preserve its integrity and independence, but if it should go under, the world will then face a united Red China, allied with Moscow for the complete domination of all Asia. The future is far from bright, but Manchoukuo looks forward with hope and confidence that saner minds will find some way to stabilize conditions and usher in a new era of peace and understanding founded on the rights of the people of China to a voice in their own affairs. And this, to my mind, can be brought about only by the recognition of Manchoukuo and what it stands for.

Recognition Not an Essential

This conclusion is not in the nature of an appeal for recognition. Manchoukuo is not seeking recognition or financial assistance. The League and the American Government say in effect: "We do not like the way you achieved an independence that conflicts with treaties and policies designed to preserve the territorial integrity of what is known as China; you may believe that Manchuria has always been independent and that you had the right to assert that independence; but your ideas conflict with treaties we have entered into for the protection of our loans, our trade rights and our investments in that country. Moscow may flout these treaties with impunity by creating an independent Soviet Republic in Mongolia, but we cannot permit the precedent to be extended to Manchuria. The people of Manchoukuo must return to the rule of the Chinese war-lords and accept our solution to their problems." In effect, the League recommends, and the United States concurs, that the League will act as Trustee in Manchuria for the war-lord of their choice, while they co-operate with him in the establishment of a strong central government somewhere in China Proper. "If you reject our solution, we will refuse to recognize you; we will penalize and ostracize you and bring all the weight of our diplomacy to bear in order to reduce you to submission. But while we are doing this, you must keep the door open so we can trade with you. Your political morals may be bad, but your money is good."

Manchoukuo accepts the verdict and replies: "Come and do business with us." Commerce does not depend upon a formal exchange of diplomatic and consular officials with their staffs of commercial attachés, trade commissioners, treasury agents and other business go-getters. Agents of American manufacturers can sell their goods in Manchoukuo and purchase the products of that country without all this hullabaloo about the Open Door. When Americans speak of the Open Door, we mean a door that opens for us to enter but does not swing the other way. The old trade axiom has been forcibly brought home to the American people in the past few years. **You cannot sell unless you buy.** If America wants to dispose of more of its goods in the market of Manchoukuo, why not buy something it has to sell? Every dollar you spend in Manchoukuo will be returned in purchases of American materials. For example, you can buy Manchoukuo coal and iron for the Pacific Coast and there is no reason why you should not purchase bean cake for fertilizer or cattle food and build up a trade that will balance itself the same as Japan has done. Don't insist on making it a one-way proposition.

If we cannot buy Manchoukuo's agricultural products the same as other countries, because our farmers will demand a higher tariff to protect their products, don't call Manchoukuo names and accuse it of closing the door if its necessities compel it to import from those who do buy its cereals. Manchoukuo is doing its best with its limited resources to create a new market for many manufactured goods that it can buy better and cheaper in the United States than in any other country. Its wealth is largely agricultural. Soya beans are the mainstay of its farmers. America does not buy any of these beans or the oil and cake expressed from them, but other countries take over 3,000,000 tons annually. Germany has purchased over a million tons (Manchoukuo's most important customer), but this year, in order to protect home agricultural interests, its government placed a prohibitory tariff on further imports of soya beans. Manchoukuo now faces the loss of this market.

There will be a surplus of over two million tons of beans in Manchoukuo this year, and if the people are to live, they will have to plant wheat and look forward to supplying the Far East with this staple. Now suppose that instead of purchasing American automobiles, trucks, road and farm machinery, Manchoukuo should say to Germany: buy our beans and we will buy these manufactured materials from you. Should Manchoukuo adopt this barter system along the same lines as Brazil and other countries and exchange its main crop for German mechanical products, the market would be practically closed to the United States for everything except oil, cotton and tobacco. Manchoukuo would then be accused of closing the door to American trade and of violating its pledges. As Manchoukuo is not recognized, and is still considered a part of China, a violent press propaganda would be let loose upon the new State. However, the case is merely a hypothetical one.

The Government of Manchoukuo is doing its best to surmount its difficulties and develop the new State so that it will create a real market for foreign manufactured materials. Normally, the trade of Manchuria is about one-third the total of what was formerly China. If it can double this volume in the next few years, the trade of the thirty million people of Manchoukuo will become as valuable as that of the 500,000,000 who reside south of the Wall. That is Manchoukuo's goal.

Will Manchoukuo reach it? I believe she will, and for this reason. Under the old régime all the wealth of the country flowed into the pockets of the war-lord and his clique. The only business Americans could do in Manchuria was with this official group, which monopolized every line of trade and all of the industries not controlled by the Japanese. It was a very sticky business. Sometimes we were paid and sometimes not. When we were, the money passed through so many hands that by the time all commissions and squeeze were deducted, there was very little profit left.

Under the old régime, the people had nothing. All their crops had to be sold to an official purchasing organization which paid them in worthless paper notes. The crops were then sold for gold or silver, and the hard metal went into the pockets of the war-lord. Nearly seven billion dollars in these worthless paper notes were foisted on the people at the point of the bayonet. Two years ago, the actual exchange value of these notes was perhaps 60,000,000 silver dollars, or an average depreciation of one hundred to one. The people could hardly purchase the bare necessities of life. Sunk in poverty and overawed by an army of 400,000 men, backed up by the largest arsenal in Asia, these people were reduced to slavery, compelled to work and surrender the product of their toil in order to supply the funds for the maintenance of an army whose only object was to keep them in subjection.

The Birth of a Prosperous Era

These conditions are now reversed. For the first time in many years, the farmer can bring his produce into the railway centers and see chalked up on the official bulletin boards the market quotations for the day. He sells his produce at the market price and receives real money in payment. These people are now happy. They have a new and brighter outlook on life. Last year they were able to pay their debts and lay in their store of winter provisions and clothing. They also purchased a few comforts. This year they will buy more comforts. Next year they will buy a luxury or so, and it will not be long before they will be buying automobiles, improved farming implements and machinery and a

thousand things they could never buy before. This is what the Government of Manchoukuo hopes to do. If that does not make for human progress, happiness, and prosperity, I do not know what to call it.

I will not weary you with the details of Manchoukuo's progress. The success of its program rests on two basic essentials: First, the restoration of law and order, and the suppression of banditry that will bring security to the people. There are still some forty or fifty thousand bandits roaming the countryside. It will take another two years to bring them in and set them to work or, if all other methods fail, to exterminate them. That is the task of the army. Hand in glove with this, goes the stabilization of the currency. By next June all the worthless paper notes will be redeemed. With peace, security and a little prosperity, Manchoukuo will forge ahead and fulfill its mission not only to its own people but to the world at large. All Manchoukuo asks is to be let alone to work out its own salvation.

Manchoukuo is too proud to further explain or apologize. Its people feel in their hearts that they were justified in declaring their independence and that the day will arrive when the rest of the world will recognize they did right in separating from the chaos of China and setting up for themselves. They deeply regret that the American people, who under any other circumstances would have sympathized with their desire for liberty, have closed their hearts to their appeals. The old policies, doctrines and treaties designed for the preservation of the integrity of what is known as China, are dead. If the League and the United States are determined to stick to the carcass of dead policies; if they refuse to open their eyes to the realities; if they insist that Manchoukuo is still a part of China; that the Stimson Doctrine of Non-Recognition has become fixed in international law; then the responsibility for whatever happens in the Far East rests squarely upon their shoulders.

The American Government and the League offers Manchoukuo no acceptable alternative. They have no substitute plan except a return to the old *status quo*, the submission of thirty million free men to the yoke of a warlord who is even now menaced on all sides by coalitions determined to oust him from power. At any time we may hear of his downfall. Following its traditional policy, will the United States recognize the Government that will be set up on the ruins of Nanking? If so, the peace we hope to establish in the Far East will be further off than ever. For, unless I am wrong, the next Government of China will be Red, in league with Moscow. Manchoukuo will then be compelled to fight for its life. It can expect no help and little sympathy. It does not ask for it. It does ask for your understanding, and, if unfortunately, the issue is forced in the Far East and the American people are told they must uphold the "Sanctity of Treaties" or some other equally soul-inspiring slogan that will line you up against Manchoukuo and Japan, remember that behind these treaties stands the elemental law of self-defense and those higher and fundamental principles which conceded to all human beings their inalienable right and duty to revolt against a system that held them in slavery, and to set up their own government. Recall the principles and ideals that form the basis of our own faith, our creed and our national existence and do not harshly judge another people for appealing to the same logic and resorting to the same drastic measures to escape from their yoke, even if in so doing, they violate or invalidate some treaty, entered into without their consent, between our Government and other Powers for the advancement of their own interests.

Emancipated Slaves, Not Rulers

After suffering for more than two decades under an almost unbelievable tyranny; prohibited under severe penalties from voicing publicly or discussing privately their wrongs; ignorant even of their rights as human beings and unversed in the arts of self-government; how can we expect the people of Manchoukuo to evolve overnight a stable political system without outside assistance? In a country, where for centuries, banditry has been an honorable profession; where outlaw gangs such as we are accustomed to in the West, give place to whole armies, which ravage the countryside, storm and loot cities, towns and villages; levy contributions on travel; trade and agriculture and subject entire districts and even provinces to their rule, how can we expect the Government of the new State to restore law and order and bring security and tranquility to the people in a day or even a year?

The task confronting the authorities is difficult enough without being hampered by those elements in China Proper who look forward to again riveting the yoke of servitude on the necks of the Manchurian people. No matter what the outside world may say or think of their independence, these people see clearly their duty. Manchus, Mongols, Chinese, Koreans and Japanese are co-operating in a spirit never before manifested in Asia to build up a State on a foundation of freedom, equality and justice. Has any sympathy been extended to them by the liberty-loving nations of the West? Have you heard one word of encouragement, one sign of approbation, one recognition of their right to do something that all other peoples of the world hold as a sacred duty to themselves and their children? No! You have heard nothing but condemnation, ridicule and invective. Every impediment is being placed in the way of their success. The necessity of being prepared at all times to resist invasion from without and maintain law and order within, imposed upon the Government by the Stimson Doctrine of Non-Recognition, constitutes in itself a severe handicap to immediate stabilization. The very pronouncement of the doctrine was interpreted as an invitation to revolting elements, a spur to the ambitions of Chinese war-lords eager to conquer the territory and hold it as a "living" for their soldiers. If the doctrine was conceived in this spirit, it is having the opposite effect. It has united the people, welding them into a nation. As long as the doctrine remains the cornerstone of League and American diplomacy, the world must not be surprised if it works out somewhat contrary to its hopes and expectations.

If any government or faction in China is encouraged to believe that it can extend its rule over Manchoukuo and in this belief should send its armies north of the Wall, it may well result that instead of conquering Manchoukuo, a Manchurian army may again occupy Peking. As long as the Stimson Doctrine remains in force, such a conflict would become merely a test of strength between rival Chinese factions contending for supreme power. It is well to remember that Chinese armies have never conquered Manchuria. In every instance, it has been the other way: Manchurians have conquered and imposed their rule over China.

It is not necessary for a Manchurian army to be reinforced by Japanese contingents in order to win such a war. Even should the Japanese troops retire to the railway zone and take no active part in such a conflict, the Manchurians are quite capable of holding their own and of taking the offensive. Faced with the alternative of bowing to the will of the Powers and recognizing the overlordship of some Chinese general or political faction, or of fighting for their right to complete independence, the people of Manchoukuo will to a man, appeal to the sword to preserve their liberty. Do not think that because they have reduced their army to 100,000 men that the Manchurians will rely upon Japan to fight their battles for them. If forced to do so, they can again raise an army of four to five hundred thousand men, tax themselves to the limit and resume the Chinese war game where they left off. They have the courage, the brawn and the stamina. They now have a sense of nationalism, determined more than ever to enforce the principle of "pao-ching-an-min," "Manchuria for the Manchurians." They have the largest arsenal in Asia to supply them with arms and munitions and, if invaded, they will brush aside the help of Japan and carry the war into North China and reseal their ruler on the Dragon Throne in Peking.

Make no mistake about it, if they are ever called upon to stake their existence against the armies of China Proper, the people of Manchoukuo will conform to the strict legalities of the game and settle once and for all time the question of who is to rule over them. If a swash-buckling bandit and his narcotic-addict of a son could do it, there are other finer and higher types of Manchurian warriors who can do even better.

It may be that the Government of Manchoukuo in such an extremity will turn to Japan for military advice, for experienced airmen, and expert artillerymen, but what of that? Hsinking has the same right to employ Japanese as Nanking has to engage German military advisers and American air-craft instructors and flyers; the same right to engage fortification experts to design and lay out its trench system as Chang Hsueh-liang had to hand over to a foreign military attaché the designing and construction of the defenses of Jehol. The Nationalist armies which swarmed up from Canton and conquered the Yangtze Valley were directed by Communist generals, political advisers, propaganda experts and cheerleaders, and there was no protest from the Powers against this intervention in the affairs of China. Manchoukuo can employ

Japanese army officers to advise its generals and direct their campaigns without involving the Japanese Government in dispute. The people of Manchoukuo are fully aware of the precedents created for them and face the future with supreme confidence.

A People Weary of War

They have no desire or intention to extend the authority of their government beyond the Wall or westward into Mongolia. They have no designs against Eastern Siberia or Vladivostok. They are content to remain within their own traditional boundaries. They have been bled white to pay for the military adventures of the Chang régime and they now desire peace, time to recuperate and enjoy a little prosperity. They are fed up with war, but if forced to defend their frontiers, they will again gladly submit to the grinding taxation necessary to maintain the armies required to safeguard their independence.

On the assumption that Japan has in some manner unexplained annexed the territory of Manchoukuo in contravention of the Peace Pacts, the League and the United States have united to enforce and implements the Stimson Doctrine of Non-Recognition of the new State. That doctrine is merely an incitement to further war and bloodshed. If persevered in, it may bring about wholly unexpected results.

In the United States, the bond of union is the Constitution, a compact between sovereign states. There exists no such bond uniting the provinces of China. The only cement that holds that vast country together under any form of government is the recognition of the Powers to the Faction temporarily in control of Peking or Nanking and the payment to that Faction of the foreign-supervised customs revenues. Yet each province considers itself independent. War against the recognized Faction is not an act of rebellion but merely a struggle for supreme power. As long as any province continues the fight for supremacy, it is well within its rights and the Powers dare not intervene. But should one of these provinces reverse the rule, withdraw from the conflict and stand on its unquestioned independence, it immediately becomes a rebel against the recognized government and a violator of treaties designed to preserve the country intact for the perpetuation of the Open Door principle. The combined weight of foreign diplomacy is then brought to bear to coerce this province to subordinate its independence to the recognized war-lord. It must either submit or continue to fight. There is no alternative. Its right to self-determination and complete liberty is blocked by treaties and policies, and it must submit to seeing its revenues from foreign trade handed over to the recognized war-lord and expended to pay the armies maintained for its subjection.

Now I have only this to say. As long as no constitution exists to weld these independent units into a compact whole; as long as the faction recognized by the Powers enjoys the sole right to impose its rule over the rest of the country by the sword; as long as this recognized Faction is incapable of discharging the rudimentary functions of government and is powerless to extend protection to other provinces against invasion and insurrection; then the provinces so menaced are well within their sovereign rights to declare their independence, set up their own government and prepare to defend their territory against a menace entrenched in an adjoining section of what at one time was also an integral part of China. If the right of these provinces to independence be rejected; if their right to defend themselves is set aside in order to preserve the fiction of the unity of China and they are exposed to the horrors of a Communist invasion, whether from the north, west or south, they have only one alternative. The Stimson Doctrine admits of no compromise. It says to the people of Manchoukuo that they must fight. The people of Manchoukuo do not want war. They want peace. But if the issue is forced upon them, they will place their trust in the God of Battles and if need be go down fighting for their security and tranquility. For Manchoukuo is not a puppet. It is an independent state; independent of China; independent of Japan. It will defend that independence at all costs. The people of Manchoukuo have placed their faith and trust in Japan to stand by them in their struggle. I have supreme confidence that this trust will not be betrayed.

A Bit Of History

And now, at the end of my talk, I will tell you a story. You may recall that in 1898 after Admiral Dewey destroyed the Spanish

fleet in Manila Bay and declared a blockade of the port, the warships of other Powers hastened there for the protection of their respective national interests. You will recall that a German squadron arrived shortly after, under the command of Admiral von Diedericks, who immediately began to interfere with Dewey. To make matters worse, Prince Henry, the brother of the Kaiser, then in Shanghai, declared that the Powers would never permit the United States to hold the Philippines. The Germans were looking for trouble and very nearly found it. You will recall that at one crucial moment when it looked as though the German fleet was ready to interfere with Dewey, Captain Chichester, commanding the British cruisers, steamed his vessels in between the German and American war-ships; a warning to von Diedericks to watch his step. But you do not know that at the same time one lone Japanese cruiser, the *Akitshushima*, under the command of a Captain Saito, lined up with Chichester.

You must remember that the cable between Manila and Hongkong was cut, that there was no direct communication between the foreign fleets and their home governments. Saito acted on his own initiative, without instructions. It has never occurred to American writers what might have happened had Saito lined up with von Diedericks. Had the Japanese any real enmity towards this country and shown it at that moment, the history of the Far East from 1898 to date would have to be rewritten.

Do you know that immediately after this incident, Captain Saito was ordered to report to Tokyo? Do you know that instead of a reprimand, he was promoted to be vice-minister of the Navy with the rank of Rear-Admiral and that he held this post for eight years and was made a Viscount by his Emperor for his skillful handling of the Navy during the Russo-Japanese War? Do you know that he was then promoted to Minister of the Navy and that he held this portfolio for another eight years, retiring from active service in 1914? Then, six years later, when Japan was looking round for its most Liberal statesman and administrator

to fill the post of Governor-General of Korea, the Emperor called Admiral Saito from his seclusion and entrusted to him the most delicate task confronting the nation? And, when after he had discharged his mission in Korea and again retired, he was once more, by the unanimous voice of the nation, drafted into active duty. This old friend, the fighting captain of the *Akitsushima*, is now Admiral Viscount Saito, the Premier of Japan.

When, a few months ago, the question of the ultimate independence of the Philippines was being discussed and Premier Saito through his official spokesman announced that Japan stood ready to sign a pact with the United States guaranteeing the independence of the Islands when we cast them adrift, practically every newspaper in this country which commented on it, replied in effect that the word of Japan was worthless; Japan could not be trusted; and to even suggest such a pact after what has happened in Manchuria was an insult to the intelligence of the American people! You can imagine the feelings of this old friend of ours on reading these hostile, caustic and wholly gratuitous rebuffs to what is merely the redeclaration of a policy he himself originally laid down and which has since become the policy of all successive Japanese Governments.

Now, when you are again told that Japan intends to annex Manchoukuo, I ask you to remember that the Premier of Japan, Admiral Viscount Saito, the man who stood by Dewey at Manila, has affixed his name to a document recognizing the full and unimpaired sovereignty and independence of that country. You will be told that his word counts for nothing, that the militarists are now in control of the Government; but again remember that at the head of these militarists stands that Grand Old Man of Japan, the foremost Liberal of them all, the man, who, next to Admiral Togo, is venerated by the people as one of the greatest sea-fighters of their nation. You can depend upon it that what he has to say, goes in Japan. The Japanese nation will support their spokesman. Manchoukuo will remain independent.

Trade of Manchoukuo

As Reported in the "British Chamber of Commerce Journal," Shanghai

THE Bureau of Commercial Affairs, Department of Foreign Affairs, Hsinking (Changchun) has issued a bulletin, the contents of which are devoted to "Finance and Commerce." These the *Journal* is permitted to reproduce.

[BULLETIN No. 1]

Tendency of Foreign Trade

October 30, 1933

An interesting trend of the foreign trade of Manchoukuo may be witnessed in the monthly trade returns for imports and exports which follow: (Unit: M.Y. 1,000,000).

Months	Imp.	Exp.	Balance Exp. (+) Imp. (-)	Total
January	41	47	(+) 6	88
February	38	46	(+) 8	84
March	41	37	(-) 4	78
April	46	41	(-) 5	87
May	36	35	(-) 1	71
June	32	37	(+) 5	69
July	34	31	(-) 3	65
August	47	27	(-) 20	74
Total	315	301	(-) 14	616
Total trade values of Chinese Republic for				
January-August	\$974	411	(-) 563	\$1,385

Taking into consideration the figures of this country for 1932, viz. Hk. Tls. 395,000,000 for exports, Hk. Tls. 193,000,000 for imports and Hk. Tls. 202,000,000 for an export excess, a remarkable change in the foreign trade situation of this country is at once evident. Although Manchuria had established herself in the world trade as a land traditionally enjoying an export excess, the situation this year, at least so far, as is well expressed in the above table, foreshadows that Manchoukuo will steadily develop into a rich

market for foreign goods. It should, however, not be overlooked that the export trade of the country during 1932 was greatly handicapped owing to an enormous decrease in exports to the China market and inactive shipment of soya beans to Europe and bean cakes to Japan where a serious depression continuously prevailed.

In the circumstances, therefore, it may be somewhat hasty to conclude that the present situation will prevail permanently in the future in the Manchoukuo market, but, at the same time, there is every reason to believe that the imports into this country will become more active than ever for some time to come, especially in view of the fact that various branches of constructive enterprises such as house building and road and railway construction are actively in progress. The gradual development of natural resources all over the country coming in the wake of the restoration of law and order in the interior further leads to an increase in the purchasing power of the 30,000,000 masses.

The direct foreign trade of Manchoukuo by countries is as follows: (All in M.Y. 1,000,000).—See table on next page).

[BULLETIN No. 2]

Survey of Trade in Antung District

October 31, 1933

Due to a heavy increase in the import duties levied by the Republic of China, in May last, merchants of Shantung and North China seem to be inclined to obtain their supply of goods of the cheaper quality by junks and other sailing vessels from Antung and other districts of Manchoukuo, while the export of cotton textiles manufactured by the local cotton mills has been very active. According to a recent survey, the output of the various local mills is still far from meeting the demand of the market.

There are some twenty textile mills in the Antung district, and among these which are manufacturing an enormous quantity of textile goods with an ample supply of funds, the Shung Hsing Mill stands first in the list followed by the Yuan Chih Yü Mill.

The import of Chinese made cotton goods, has considerably decreased, due to the raising of Customs Tariff. And people are depending upon domestic products.

Because of a change of conditions the manufacturers here, are doing their best to prepare for the improvement of products by employing modernized machines. It is also reported that fresh products from the various mills are magnificent and quotations have been much arresting the attention of new and old customers.

The products are mostly drills, jeans, sheeting and brocades of figured and striped in design. Others such as flour bags and cheese cloth are also included among the manufactures. There is practically no difference in quality from the imported piece goods. In the circumstances, prosperity and bright future may well be anticipated.

Junks for transportation of grains have resumed their service within this port. According to a report from the Local Navigation Association, the tonnage of junks carrying grains and the variety of grains registered at this port are as follows:

Oct. 19	Green beans	3	Junk-loads	100 piculs
" "	Grains assorted			50 "
" 20	Green peas	5	Junk-loads	300 "
" 22	Green peas	7	Junk-loads	350 "
" "	Grains assorted			170 "

The direct foreign trade of Manchoukuo by countries is as follows:—(Total imports and exports Unit: M.Y. 1,000,000).

	Japan	China	Germany	G. Britain	U.S.A.	Hongkong	France	U.S.S.R.	Others	Total
January	49	11	10	3	2	2	.3	2	8.7	88
February	48	8	7	3	4	1	.3	3	9.7	84
March	43	9	6	2	3	1	.2	4	9.8	78
April	45	15	7	2	4	1	.2	3	9.8	87
May	40	11	5	2	3	1	.4	2	6.6	71
June	41	9	5	1	3	1	.4	1	7.6	69
July	34	11	6	2	2	1	.3	1	7.7	65
August	42	13	7	2	3	1	.5	.4	5.1	74
Total	342	87	53	17	24	9	2.6	16.4	65.0	616
%	56%	13%	9%	3%	4%	1%	.4%	3%	10.6%	100%

There are now only thirty-three junks from Shantung at this port. The scarcity of these ships is due to the fact that the Yalu River is closed during the winter season. As Antung is well situated, being available for both river and land service, the port is generally filled with these junks, and the traders interested in the junk trade are numerous. Most of the large junks are possessed by the traders of Shantung province, being engaged in carrying passengers and freight between Antung and Shantung ports. These vessels come or go only once in every ten or thirty days. The one point that should be noticed is that the Shantung junks navigate during summer, and as soon as the Yalu River becomes shallow towards the approach of winter, the navigation is completely suspended. At present there are only thirty junks in all with a limited tonnage.

[BULLETIN No. 3]

Foreigners Entering Manchoukuo with Passports Vised

October 31, 1933

From June 1 to September 30, 1933

	June	July	Aug.	Sept.	Total
Americans	100	73	122	92	387
Belgians	7	1	1	7	16
British	45	54	137	64	300
Canadians	4	2	0	0	6
Danish	12	1	28	4	45
French	16	15	36	28	95
Germans	24	15	42	39	120
Greeks	55	1	2	7	65
Italians	6	1	4	2	13
Polish	11	10	20	12	53
U.S.S.R.	40	44	118	115	317
Others	26	43	68	70	207
Denationalized people	248	327	426	339	1,340
	594	587	1,004	779	2,964

U.S.S.R. Citizens who have Taken Refuge in Manchoukuo

Feb. 1 to Aug. 30	Entered from Manchouli	115
	(including 84 Buriat and 31 Mongol).	
Sept. 1 to 30	Entered from Pogranichinaya	28
Sept. 23	Entered from Yingkow	1
Sept. 26	Entered from Dairen	4
Sept. 30	Entered from Antung	5
Total		154

[BULLETIN No. 4]

November 3, 1933

In respect to trade relations between Jehol Province and various districts of North China adjacent to the province prior to 1931, some 30% of the trade volume was in the hands of Mukden merchants and 70% was handled by Peiping and Tientsin merchants.

In the meantime, the Department of Finance of the Manchoukuo Government established a Customs House at Chengteh, capital city of the province, in July this year, together with branch offices at Kupeikow and Pingchuan in order to facilitate trade relations between Manchoukuo and China. The first trade returns compiled by the Customs show exports to and imports from China as follows:

	Exports	Imports	Total
	M. Yuan	M. Yuan	M. Yuan
July	13,537	83,133	96,670
Aug.	24,555	484,857	509,412
Aug.	504,914	824,248	1,329,162 (Manchoukuo, Shanhaikwan Customs)

The principal articles exported from the province are beans and millet and those imported from China include cotton piece goods, wheat flour, groundnut oil, kerosene oil, bran, papers, Chinese shoes and sundries. It is generally expected that trade relations between the province and North China districts will be greatly improved in the near future as peace and order has been almost restored throughout the province.

[BULLETIN No. 5]

Foreign Trades of the Chinese Republic and Manchoukuo Compared

November 20, 1933

(1) *Customs Revenues*.—Customs revenues of the Chinese Republic for 1932 totalled some Hk. Tls. 200,000,000, which, as compared with the figures for the preceding year shows a decrease by Hk. Tls. 46,000,000 or 19%. It should be noted that the 1932 figures include some Hk. Tls. 12,000,000 collected by the Customs of Manchoukuo during January-June, 1932, prior to the independence of the latter Customs from the Chinese Customs control. The Customs revenues of the two countries compare as follows. (Unit in Hk. Tls. 1,000,000).

China	1931	China	1931
221	Manchoukuo	188	Manchoukuo
	25		26 (for Manchoukuo)
			12 (for China)

(2) *Foreign Trade*.—The imports of China for 1932 amounted to Hk. Tls. 1,049,000,000, which, as compared with the figures for the preceding year, show a decrease by 385,000,000 or 27%, while the exports totalled Hk. Tls. 493,000,000, which, as compared with the 1931 figures show decrease by Hk. Tls. 416,000,000 or 45%. The above figures for 1932, both imports and exports, include those for the open ports of Manchoukuo during January-June, 1932.

The trade figures for China and Manchoukuo—(see table below). (Unit: Hk. Tls. 1,000,000).

The following table indicates that the total trade volume of China for 1932 decreased by 28% as against the 1931 figures, while that of Manchoukuo for 1932 decreased by 16% as against the 1931 figures. As a result, China witnessed an adverse trade balance Hk. Tls. 613,000,000 while Manchoukuo retained favorable trade position with Hk. Tls. 202,000,000 as an export excess.

(3) *Trade Values of China and Manchoukuo by Countries*.—Trade values of China and Manchoukuo by countries are as follows: (Unit: Hk. Tls. 1,000,000).—(See table).

	1931	1932	1931-1932 Compared
	China	Manchoukuo	China
Imports	1,285	219	978
Exports	587	474	365
Total	1,872	693	1,343
Balance (+) or (-)	(-)698	(+)255	(-)613
			(+)202

Countries	IMPORTS				EXPORTS				TOTAL			
	China		Manchoukuo		China		Manchoukuo		China		Manchoukuo	
	1931	1932	1931	1932	1931	1932	1931	1932	1931	1932	1931	1932
Japan (including Korea, Formosa) ..	201	100	94	112	97	45	183	149	298	145	277	261
Great Britain	115	117	4	5	39	31	16	7	154	148	20	12
U. S. A.	307	265	13	11	114	55	6	31	421	420	19	42
Germany	78	70	5	4	17	25	6	47	95	95	11	51
China	—	—	66	35	—	—	148	109	—	—	214	144
Others	584	426	37	26	320	209	115	52	904	635	152	78
Total	1,285	978	219	193	587	365	474	395	1,872	1,343	693	588

N.B.—The 1932 figures for China in the above table represent the net trade values, the estimated figures for the first half year of 1932 being deducted in favor of Manchoukuo from the total China trade values for 1932.

Among other things, the above table reveals:

(1) In the 1932 trade, as compared with the preceding year's figures, Japan lost some Hk. Tls. 100,000,000 in her exports to China, while she gained some Hk. Tls. 18,000,000 in her exports to Manchoukuo. In imports from China and Manchoukuo, Japan witnessed a decrease by Hk. Tls. 52,000,000 and Hk. Tls. 34,000,000 respectively.

(2) Great Britain gained in her exports some Hk. Tls. 2,000,000 to China and Hk. Tls. 1,000,000 to Manchoukuo respectively, while in her imports from China and Manchoukuo she lost some Hk. Tls. 8,000,000 and Hk. Tls. 9,000,000 respectively.

(3) The U.S.A. lost in her exports some Hk. Tls. 42,000,000, to China and Hk. Tls. 2,000,000 to Manchoukuo respectively, while in her imports from China, she lost some Hk. Tls. 59,000,000 and gained Hk. Tls. 25,000,000 from Manchoukuo.

(4) Germany lost a certain amount in her exports both to China and Manchoukuo, while she gained in her imports some Hk. Tls. 1,000,000 and Hk. Tls. 41,000,000 from China and Manchoukuo respectively.

(5) Manchoukuo lost some Hk. Tls. 31,000,000 or 46% in her imports from China and some Hk. Tls. 39,000,000 or 26% in her exports to China.

4. *Manchoukuo and Principal Markets of China.*—(1) *Tientsin.*—Owing to the loss of markets in Manchoukuo, various factories have curtailed their outputs, while fresh enterprises are mostly neglected.

(2) *Chefoo.*—Owing to a recent decrease in the export of fruits to Manchoukuo markets, fruit cultivators and canned fruits manufacturers are in distress.

(3) *Weihaiwei.*—Rubber goods manufacturers are rather inactive in their business, due to the loss of Manchoukuo markets.

(4) *Tsingtao.*—Exporters of groundnuts are watching the market situation in Europe and America with much concern where the products are in competition with the superior Manchurian ones.

(5) *Kiukiang and Wuhu.*—Favorably stimulated by a recent

decrease in the export of Manchurian staples to the Kwangtung district, the interport business between the Kiukiang-Wuhu districts and South China ports has become a little brisk of late.

(6) *Shanghai.*—As a result of the loss of Manchoukuo markets, sundry goods manufacturers are generally in distress.

(7) *Soochow.*—The export of tea to Manchoukuo from the port has been greatly affected.

(8) *Canton and Swatow.*—Merchants in these places are in distress, due to a recent decline in transactions of Manchurian staples.

[BULLETIN No. 6]

November 21, 1933

The following table shows some of the principal articles bought from European concerns through the Supply Bureau of the General Affairs Board by various Government organs in Hsinking, which figures do not include some articles bought directly by the Government organs as well as the provincial Governments or Municipalities.

		April-Dec., 1932	Jan.-Oct., 1933
U.S.A. :	Motor cars, tractors and parts thereof	263,489.00	1,002,489.01
	Gasoline, etc.	85,721.79	133,339.50
	Others	9,523.60	3,721.61
	Total M.Y.	358,734.39	1,139,550.12
Great Britain:	Motor-cars, tractors and parts thereof	26,200.00	3,215.00
	Others	400.00	34,125.00
	Total M.Y.	26,600.00	37,340.00
Germany :	Arms and Munitions	34,482.00	23,815.00
	Photographic apparatus	1,400.00	8,163.00
	Others	18,324.00	38,412.00
	Total M.Y.	54,206.00	70,390.00
	Grand total M.Y.	439,540.39	1,247,280.12

“The Opium Clippers”

ANOTHER great book of the sea has been written by Commander Basil Lubbock and has just been issued by the well-known nautical publishers, Messrs. Brown Son & Ferguson, 52-58 Darnley Street, Glasgow. The new book is “The Opium Clippers” and as the publishers truly say, “Of all the sea trades engaged in by man from the times of the Phoenicians down to the present day that of the Opium traffic into China was one of the most risky and adventurous, for it was a forbidden trade on a scarcely known coast amidst wild, stormy seas and in the haunts of the most cruel pirates the world has ever known.

“Compared to it smuggling in the English Channel during the Napoleonic Wars was child's play; gun running along the Spanish Main a dull pastime; and blockade running out of the American cotton ports as safe as summer yachting. Nor was black-birding in the cannibal Solomons a whit more exciting; and not even Rum Row in its most lawless days could rival the Cap-sing-moon Anchorage for battle, murder and sudden death. The captains of the little opium clippers, not one of which exceeded 500 tons register,

had to navigate unsurveyed, uncharted waters, full of reefs and shoals, of roaring waterspouts, rippling currents and black raging squalls. They had to force their ships against the relentless monsoon and battle to the death with the screeching typhoon of the China Seas and the equally dreaded cyclone of the Bay of Bengal. They had to run the gauntlet through fleets of treacherous Malay prahus; they had to outwit the marauding Dyak and slip away from the showering stink-pots of the Chinese pilong. Arrived on the coast it was a case of tompons out of the guns, boarding nettings triced up, sentries fore and aft and a double anchor watch.

“As for the little clippers themselves, it was a racing passage each way. They had to be able to bear sail and make mileage when not only Indiamen and country craft but British men-of-war were forced to turn back discouraged. These fine-lined, well-built, heavily rigged clipper barques, brigs and schooners, sailing under the British and American flags, not only trained an incomparable set of seamen for their Mercantile Marines but were the chief means whereby China and Japan were opened up to the outside world.

"A word about the actual business of the trade, which was certainly not without its excitements; Parsee, Bengalee, Malay, Chinese and Jew contended with the Britisher, the American, the Dutchman, the Portuguese and the Spaniard for the spoils of the market. Whether in Bombay, Calcutta, Singapore, Canton or Hongkong men fought with all their wits with fortune or bankruptcy as the stake. Even the shrewdest business men went under in the gamble for the forbidden drug, for the price of the "Black Mud" had a way of sky-rocketing one moment and dropping like a deep-sea lead the next. Yet the victors came out of the fray with princely fortune, and the great firms such as Jardine, Matheson & Co., and Dent & Co., in their vast hongks at Hongkong and Shanghai dispensed a regal hospitality and behaved in more lordly style than the great John Company had ever done. These little opium clippers, their owners, their captains and their crews nobly maintained the prestige of the white man in a land where "loss of face" was a never-ending disgrace.

Those who glory in the old traditions of the China coast and all those who would trace the dramatic development of British and American trade in the Far East will find a treasure store in "The Opium Clippers." The book is a large and handsomely done volume, 9½ by 7½, of 384 pages, and the many splendid illustrations, pictures of sailing craft that no man living to-day has actually seen at sea, make it easily understood that the author had to devote a full quarter of a century to the task of gathering materials for his book. For the aid he received in this work he expresses thanks to the "old hands on the China Coast, notably the descendants of the Dents, Mathesons, Forbes and Pybus Brothers and to captains and to more than one naval officer."

The book covers the period from 1820 to 1868; the chapters are arranged chronologically and teem with incident and intensely human anecdotes told with vigor and candor. Mr. Lubbock has specialized in authentic tales of sailing ships and made them an art of his own. He has the gift of striking the rarest note of romance by joining romance with reality. Against the dawn of modern trade in China, and the flash of the much misunderstood Opium War the author, with historical accuracy, has drawn a powerful picture of the Opium Clipper in all her loveliness of beauty and ugliness of purpose.

Some idea of the author's powers as a narrator and the stirring nature of the stories he unfolds can be given in his description of the incident when H.M. Gun Brig *Childers* hurdled a reef in a storm. Here is the way he tells it:

"Only one ship ever bumped on the Pratas and came off—and that was Her Majesty's gun brig *Childers*, which topped the barrier reef on the crest of a typhoon wave on October 10, 1848.

"She was running from the storm fiend like a tired hare before a pack of noisy beagles. Her mainmast had gone by the board. Her guns, shot and much other gear had been sacrificed to Davy Jones. Her worn-out crew hung desperately to life lines which had been stretched fore and aft. Her commander and officers vainly tried to pierce the driving sheets of spray with bloodshot, salt-rimmed eyes. A weird screech from the lookouts forward was unheard in the wild hooting of the elements, but its cause was soon apparent to all hands. Stretching for two

points on either bow, there suddenly appeared a snow-white ridge, for all the world like the view of the Himalayas from the Simla hills. It was the mountainous surf breaking on the horseshoe-shaped coral reef, which bounded the Pratas on the North.

"The *Childers* was that same lively brig whose keel Harry Keppel caught a glimpse of in a Mediterranean squall. She was travelling then, but she was actually flying before the typhoon, flinging half her length out of the water at each plunge and recovery. As she leaped nearer and nearer the line of surf a deep booming began to be distinguished, making a thunder-like base to the shrill screaming of the typhoon.

"There was nought to be done—no possible way of avoiding the jagged rocks—no time to round her to, even if this had been possible without a capsizing.

"Steady your helm!" was all Commander Pitman said, or rather bellowed into the ear of the helmsman.

"Steady it is, sir," returned the quartermaster, directing the helmsmen with a hand on the spokes.

"Keep her dead before it!" went on his commander.

"Aye, aye, sir," growled the old sea-cunny at the con, his chew high under his cheek bone and his jaws working. He was not the man to get rattled.

"A second later and the brig rose on a gigantic sea, up, up, up, throwing the spray on either bow as high as her foreyard, as she cleft the great breaker in twain.

"Hang on all!" roared the commander through his speaking trumpet.

"There was little need of such a caution. All hands had lashed themselves with the running gear to life lines, fife rail or belaying pin.

"The next moment the *Childers* was right on top of the reef. There was a dull, grinding crash—the old quartermaster and his two helmsmen were sent sprawling as the wheel kicked violently. The wheel spun; three pairs of hands grabbed it and held on, but to their astonishment it was like a feather for lightness—the rudder had been torn from the sternpost!

"For perhaps a split second the *Childers* hung poised, shaking from stem to stern, her decks hidden in a cloud of thick spray—then she leaped forward again. The gallant sloop had jumped the reef. Suddenly she lay quiet, then began to twist and turn in a maelstrom of swirling soapsuds under the lee of the reef. Though the niggerheads literally bristled all round her, she had landed after her giddy leap in a clear patch of deep water with a white sand bottom under her.

Such an escape from almost certain destruction is scarcely believable, and one would not dare to put it into a book of fiction, but the *Childers'* adventure may be found in calm official language in the Admiralty records. The anchor was let go, and the hard tried vessel lay at peace with the hurricane still screeching overhead.

"For fifteen days she was compelled to remain at anchor in the Pratas lagoon whilst her people sought to find a way out by sounding. All her boats had gone except for a tiny dinghy. By this means a channel sufficiently deep to float the sloop was eventually found, and the lame duck was piloted to sea after perhaps the most marvellous escape that ever happened in the China Seas."

"Made in Japan" is Writing on the Wall for British Industry

By G. WARD PRICE, Special Correspondent of "The Daily Mail"

(In the following an interesting British viewpoint regarding the disturbed commercial relations existing between Japan and Great Britain is set forth.)

THREE words sum up the greatest problem confronting Britain's export trade.

They are: "Made in Japan."

Goods bearing those words are capturing our markets everywhere—in the Dominions and Crown Colonies as well as in foreign countries.

Tariff barriers keep them out no more than sand castles check the rising tide.

Their cheapness is irresistible; their quality often excellent. Throughout the world, the low production costs of Asia are challenging the high production costs of Europe.

Public attention in England is concentrated on other critical matters nearer home, but in Japan one of the great questions of the moment is "What will be the future of Anglo-Japanese relations?"

The answer entirely depends upon what solution is found to the intense commercial competition that has sprung up between the two countries.

For 20 years we were allies; now we are rivals: shall we in the future be friends or adversaries?

Japanese competition is for our country the writing on the wall. It depends upon ourselves whether what is written proves to be a death-sentence or a warning.

Japan has brought Great Britain face to face with the great new economic fact that has developed since the war: that our old world-monopoly of manufacture has gone.

For a century from the invention of steam-driven machinery at the beginning of the last century we were beyond comparison the greatest industrial country on earth. We manufactured for the peoples of the entire globe, and fixed our prices to suit ourselves.

In that hundred years we grew not only immensely rich, but overwhelmingly self-confident. We did not realize that it was the good fortune of our coal supplies that had secured for British factories the markets of all foreign lands.

With good-natured, almost contemptuous tolerance, we let other nations send their young men to study our methods. We sold them machinery of our own invention and manufacture with the secret conviction that they would never be able to use it.

These comfortable beliefs prevailed with especial strength in the cotton trade. The people of those gloomy, rough-paved towns that lie between Manchester and Blackburn have never suffered from an inferiority complex.

"What Lancashire thinks to-day England will think to-morrow," was the saying by which they expressed their view of their fellow-countrymen.

If, 30 years ago, anyone had retorted: "And what Lancashire makes, to-day, Japan will be making to-morrow," hearty, complacent laughter would have been the only response.

We used to think that Lancashire had a divine right of cotton manufacture for the whole world. Since the war we have learned our mistake.

In 1913, England exported 7,075,000,000 square yards of cotton fabrics. Last year her export was less than one-third of that total—2,200,000,000 square yards.

Several states have shared in the markets that Britain has thus lost, but Japan leaves all others behind in the swiftness and extent of her advance at our expense.

Japanese cotton exports last year were below our own by only 170,000,000 square yards. Japan has 8,000,000 spindles to Lancashire's 56,000,000 but more than half of ours are idle.

This competition is the most formidable industrial challenge we have ever had to meet.

There are two ways of dealing with it.

We can either fight it, by putting high tariffs or embargoes on Japanese goods entering this country and the Crown Colonies, and by encouraging the Dominions and India to do the same.

Or we can come to an understanding with Japan about market-zones, prices, and quotas throughout the world by negotiation.

At present the mood of many people in this country favors the former policy.

"Economic war is threatening between England and Japan," says an article in *Contemporary Japan*, a very influential magazine published in Tokyo, of which the September issue has just reached me.

Economic war, like other kinds, is a mutually destructive process, and it leads on very easily to real war. Anglo-German hostility had its rise in trade competition.

The safer and more reasonable way to treat the delicate and dangerous situation which has arisen between ourselves and our old friends and allies, the Japanese, is by negotiation.

We should clear our minds of prejudice against Japan. Much of it is based on ignorance. "Sweated labor" and "Government subsidies" are the explanations that one often hears suggested for the cheapness of Japanese goods.

Both are wrong. I spent three months in Japan last spring. I made many inquiries into these matters, and visited a number of cotton and other factories.

I can vouch for it that, outside the silk industry, which is largely carried on by family and cottage labor, there is no sweating, and that the supposed wholesale subsidizing of Japanese industry amounts to very little more than a couple of million pounds a year allotted to the shipping trade.

Certainly the Japanese work far harder and for about one-quarter the wages of British factory-hands. But that does not mean that they are "sweated."

They do it willingly, by inherited habit, and with their low wages they get as much comfort and happiness—and twice as much cleanliness—out of life as the British workman with four times the money.

Nor can we attribute Japan's invasion of our markets to the depreciation of her currency. The Japanese cotton industry, like our own, has to buy its raw material abroad, so that the depreciated yen does not help it there.

Admittedly, before the yen went off gold, manufacturers placed large advance-orders for stocks, but those are now exhausted.

The reasons which has made Japan so formidable a competitor are that:

Her cotton industry is equipped with the very latest plant, whereas much of ours is out of date;

Her mills are not over-capitalized, and can afford to work for small margins of profit;

Her merchants are restless in seeking new outlets overseas and travel constantly in search of customers; and

Her manufacturers work 10 hours a day, six days a week in their offices.

Whether we like it or not, the old days when Britain was the only country in the world exporting the products of her industry are gone for good.

Every modern State now seeks to be economically self-sufficient. In manufacturing for its own needs, it creates a surplus for which it tries to find a market, at almost any price, abroad.

Thus it is not only Japan that is capturing our overseas trade, but India also, which used to be our greatest customer. The decline of British shipments to India in the last five years is almost exactly equal to the increase in the output of Indian mills.

"Are we to be blamed," say the Japanese, "for producing as cheaply as we can? After all, we have the same right to live as any other nation."

It would be futile and foolish for this country to answer that question by a declaration of economic war.

We have the right—as the Japanese fully recognize—to tax their goods on the same basis as others' foreign imports, but to impose discriminatory, prohibitive tariffs or embargoes on the products of Japan would lead straight on to enmity with a country which is our well-trying friend, with which we have no other conceivable ground to quarrel.

We must face up to the new commercial conditions of the post-war world.

We must recognize that the old happy days of unchallenged British domination in foreign markets have passed away. We must come to an understanding with Japan.

People talk of the Japanese as if they were a case-hardened, callous, materialistic people. On the contrary, they are one of the most sensitive and sentimental races on earth.

The warm feeling of friendship for Britain which animates the vast majority of that nation will lead them to make concessions even at the expense of their own interests when the stage of concrete negotiations is reached.

In Japan, as in England, there are extremists who talk wildly. Ours want to organize a universal boycott of Japan. Theirs dream of driving the British out of Asia.

Neither people should pay too much attention to these outbursts of inflammatory nonsense.

We were Japan's first friend in Europe.

She will be our last enemy in Asia, if we treat her as fairly and reasonably as we expect her to treat ourselves.

New Dredger for Yangtze

Messrs. Wm. Simons & Co. Ltd., Renfrew, launched on December 1, 1933, complete with all machinery on board and with steam up ready for work, a Steam Driven Cutter Suction Dredger of their Patent Radial design, the special feature of which is that the hull is held stationary on three spuds while the disintegrating and suction mechanism is traversed to and fro across the desired width of cut. The forward spuds are equipped with rams by means of which the dredger is moved forward to take successive cuts.

This type of dredger is particularly suited for work in narrow channels, as it is entirely independent of outside moorings. The vessel was built to the order of the Chinese Purchasing Commission, under the direction of Sir J. H. Biles & Co., Naval Architects & Engineers, 40 Broadway, Westminster, London, S.W.1. and is to be used for keeping a clear berth for the Nanking Train Ferry, China.

Overhead Contact Lines of the South Indian Electric Suburban Railway

OWING to the extraordinarily rapid growth of the suburbs of Madras the number of passengers increased in such a degree that the means for conveyance existing were no longer sufficient for the efficient handling of suburban traffic. The South Indian Railway Company, Limited, therefore, decided to build in addition to the existing single track railway to Trichinopoli-Ceylon, on which both the suburban and the inter-urban trains run, a double track suburban railway from Tambaram to Egmore and to lay a second track from Egmore to Madras-Beach in order to be in a position to cope with the heavier traffic (general plan Fig. 1).

Economic considerations and the fact that only an electrically operated railway could insure a rapid and frequent service on the suburban line were the reasons for which the South Indian Railway Company Ltd. decided to electrify the new line, 80 miles in length. The following remarks give a short general survey of the overhead contact system erected for the distribution of the electric current on the line and its delivery to the cars.

In accordance with the order in which the work was carried out, the following description will be divided into three parts: (I) Foundations, (II) Steel structures, (III) Catenary construction.

The Foundation Construction

The foundations are made of reinforced concrete and have the object of giving a solid support to the poles required for carrying the catenary construction and thus prevent swaying of the poles through the forces acting upon them. The ground against which the pole presses owing to the exerted forces, offers to this pressure a resistance which increases with the size of the resistance surface of the pole. To increase this surface is the purpose of the foundation. It is evident that the dimensions to be given to the foundations depend in the first place on the forces acting upon the poles, since with an increase of these forces the pressure against the ground augments and the resistance surface has to be increased accordingly. When deciding upon the kind of foundation to choose, the class of ground in question must be considered, as the resistance offered by the ground is greater or smaller according to its nature.

Without going into details, it may be briefly mentioned that two kinds of foundations had to be made. First, foundations for poles which only have to support the catenary construction and for which the load, therefore, consists only of the weight of that construction, the wind pressure and the side pull on curves. As with these loads the resulting moment of forces acting upon the pole and having to be transmitted through the foundation are not very great, the dimensions of the concrete foot may be relatively small. In the present case, block foundations having a volume of about 1.8 to 2.8 cub.m. were chosen. The founda-

tions consist of a prismatic concrete foot with the pole in the center; the pole, therefore, stands with its foundation in the soil (vide Fig. 2).

Besides the block foundations, a second kind of foundation was made for poles which, besides withstanding the above-mentioned loads, also have to take the forces set up through the anchoring of the catenary wires. The dimensions of these foundations, which are carried out as so-called stepped foundations, had, owing to the much greater load, to be made much larger and have a volume of 4 to 8 cub.m., according to circumstances; in some cases they are larger still. These stepped foundations have, compared with the block foundations, the advantages that, owing to the better distribution of the resistance surfaces pressing against the soil, the quantity of concrete required with the same load is smaller. As may be seen from Fig. 3, the resistance surface pressing against the soil at the bottom of the foundation is particularly large, so that the greater part of the external forces, acting upon the pole, are transmitted to the soil under the foundation.

Contrary to the foundations for the supporting poles, the above foundation for the straining poles are executed as so-called anchor foundations. With these foundations the pole is not embedded in the concrete but is screwed on to the foundation by means of anchor bolts let into the concrete. According to the stresses, the anchor bolts are made 1½-in. to 1¾-in. in thickness and take up the forces acting upon the pole and transmit them to the foundation. The

reason for this construction is, in the first place, that in the case of alterations, or if otherwise necessary, the poles can be removed after unscrewing the anchor bolts.

Steel Structures

As already mentioned under (I), the steel structures have the object of supporting the catenary construction and taking the stresses to which the individual contact wires and cables are subjected. A distinction must, therefore, be made between those steel structures which have only to support the catenary construction, and those which are designed to withstand, besides, the pull produced by the anchoring. When calculating structures of the first kind, the following points had to be considered:

(a) Weight of the catenary construction, depending upon the sectional area, or weight, of the installed contact wires and cables and upon the spans between the individual points of support.

(b) Weight of the bracket arm or gantries fitted to the poles.

(c) Wind pressure against the steel structures and the catenary construction.

(d) Side pull on curves depending upon the radius of the track, the span and the tension in the individual wires.

In the calculation of the structures to be used for anchoring, besides the loads mentioned under (a)–(d), particularly the pull exerted by the contact wires and cables has to be considered. It must also be recollected that

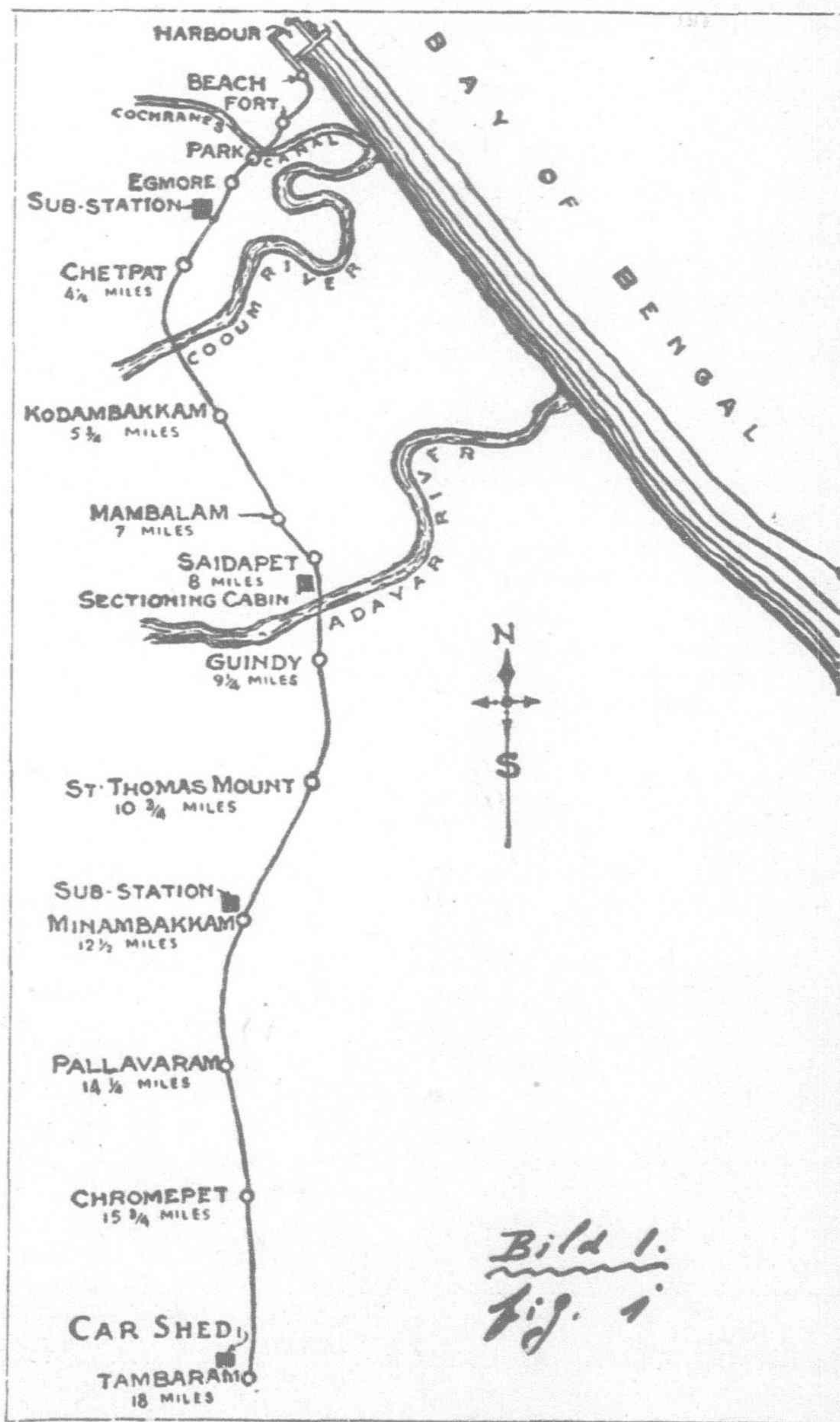


Fig. 1.—General plan of the Madras-Tambaram Line

this pull caused by the straining and the tension produced in curves, mentioned under (d), depend upon the variations in the temperature, since with the sinking and rising of the temperature the tensions in the tightly strained contact wires and the cables increase or decrease considerably.

For the steel poles which have to carry the catenary construction, expanded poles, so-called Jucho-poles, made from rolled H section, have been used. Into the web longitudinal cuts are made, leaving intact portions at fixed intervals throughout the length of the web. The intact portions are staggered. The section is then heated and expanded, so that it assumes the form of the pole shown in Fig. 4. This kind of pole has the advantage that no rivets or screws are required for the connection of the separate steel parts. The manufacturing costs are, therefore, lower than for the poles of the channel type with diagonal bracing. Besides, there is much less danger of these poles rusting than with the others, since corners, in which water could accumulate, are avoided.

For fastening the contact wires and cables over the center of the track on straight sections, brackets consisting of two U-shaped members were used. Fig. 5 shows an arrangement of this kind. In curves, top girders for supporting gantry structures consisting of two channel irons were fitted as shown in Fig. 6.

Poles and gantries which have to take the pull caused through the anchoring must, as already mentioned, be calculated for a considerably greater moment of resistance and their construction is much heavier than that of the first named poles. Fig. 7 shows a gantry structure for anchoring two contact wires. The poles consist of angle-steel with diagonal bracing; the gantries being each made of two channels, also provided with angle-steel diagonal bracing.

Catenary Construction

The catenary construction, comprising the contact wire and the messenger cable with hangers, the electrical connections and other special construction, has the object of feeding the current from the substations to the line.

The service voltage in the present case is 1,500-volts D.C. The electrical energy is supplied by the Madras Electric Supply Co. as three-phase current at 50-cycles per second and a normal power of 5,000-volts. In two substations in Egmore and Minambakkam this energy is converted into direct current of 1,500-volts from where it is brought by cables and electric connections to the contact wire. Under normal conditions, the contact wire of each track is subdivided into two sections, which are fed separately and are electric-

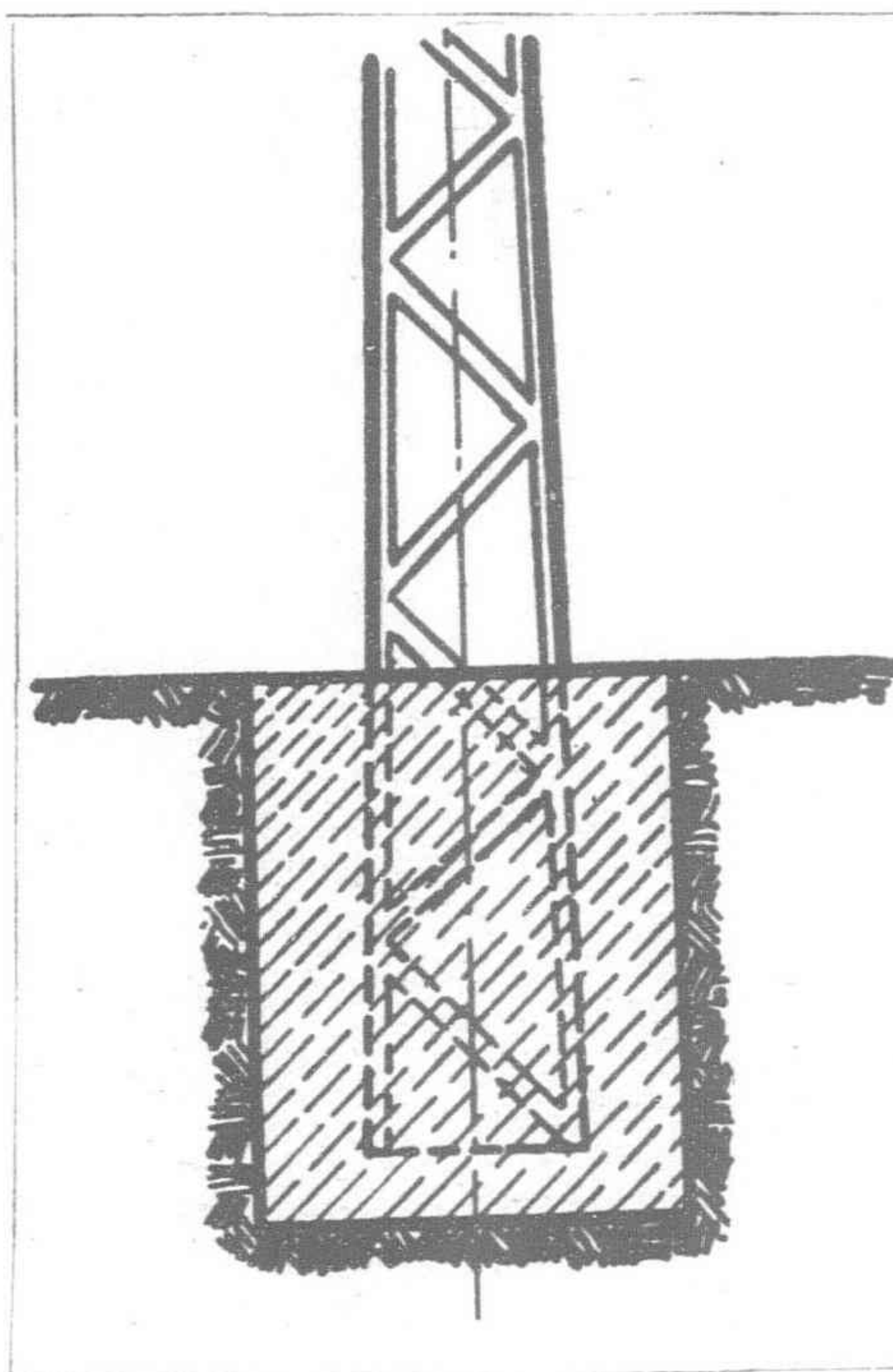


Fig. 2.—Prismatic foundation of pole

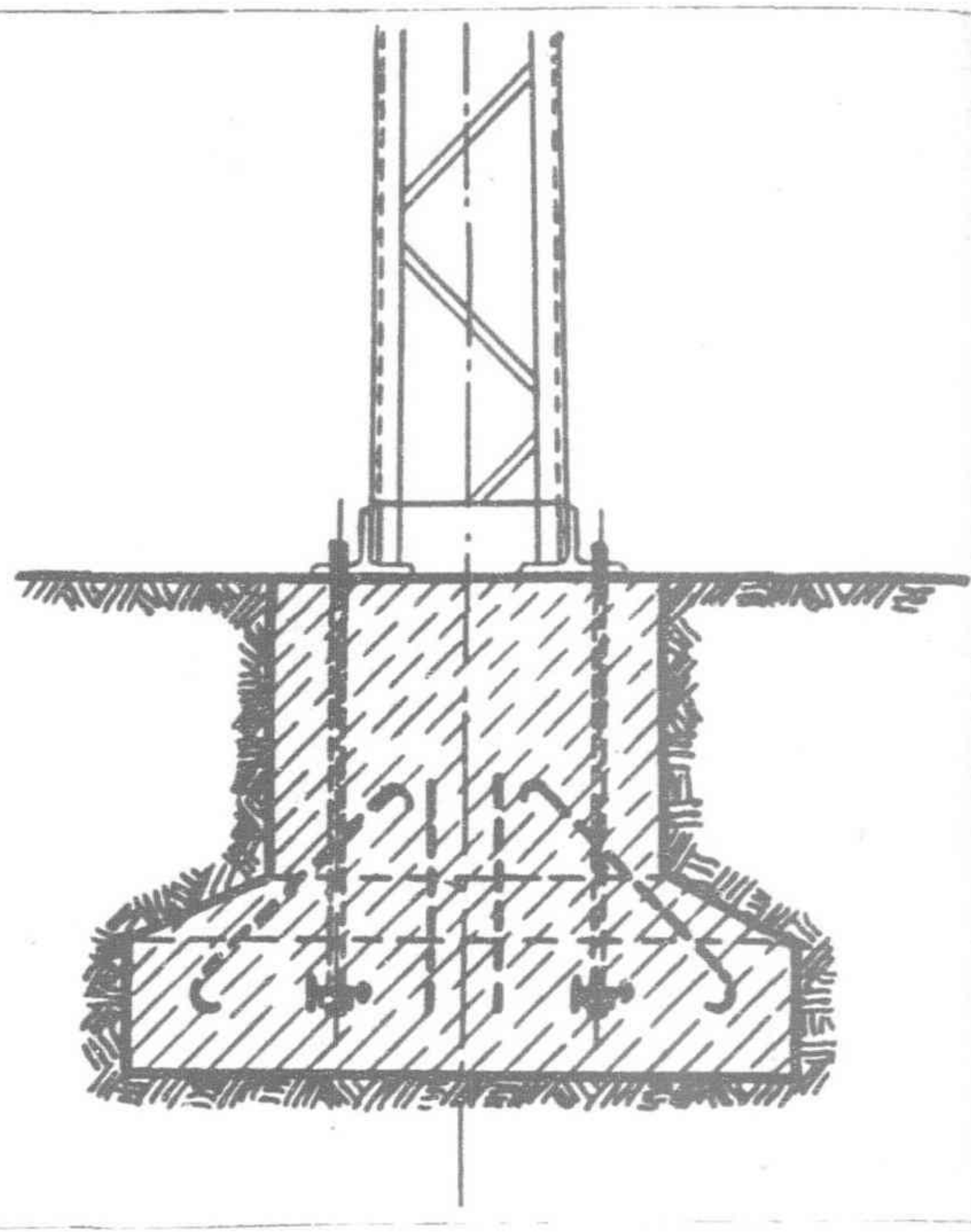


Fig. 3.—Stepped foundation

ally independent of each other. The two tracks are also electrically independent of each other. The section from Madras Beach to Minambakkam is fed from each of the two substations, the section from Minambakkam to Tambaram is only fed from the substation in Minambakkam. If, for any reason, one of the two substations is shut down, the whole section can in case of emergency be supplied with current from one point. At each station, switches are provided, with which individual subsections can if necessary be cut out, without the whole line being made dead.

As no auxiliary feeder was provided to increase the conductivity of the catenary suspension, the sectional areas of the contact wire and of the messenger cable had to be made relatively large, in order to avoid too great a voltage drop at the points the most distant from the substations. The sectional area of the copper contact wire of 0.20 sq. ins. installed over the two main trucks of the section together with the copper messenger cable of 0.25 sq. in. is sufficient to keep the voltage within proper limits on the whole section. The goods sidings at the individual stations equipped with an overhead contact line are provided with contact wires and messenger cables of smaller area, as they do not have to conduct the current of the main line. In the present case, copper contact wire of 0.15 sq. in. and galvanized steel messenger cable of 0.11 sq. in. were installed.

After these general remarks on the overhead line, a detailed description of the catenary construction will be given. The contact wire must be so installed that the cars can by means of the collector be supplied with current at any point of the line. The collector, which is mechanically pressed against the contact wire, slides along the latter, collects the current by direct contact

and conveys it to the motor of the car, from where it flows back to the substation through the rail return. As already expressed by the name "rail return," the rails are used for carrying the return current. For this purpose, the rails are connected to one another at each joint by copper bonds, so that the current flowing back to the substation

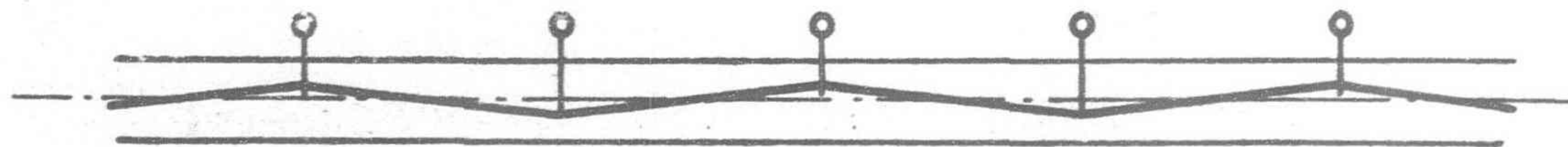


Fig. 8.—Zigzag arrangement of contact wire in straight sections of line

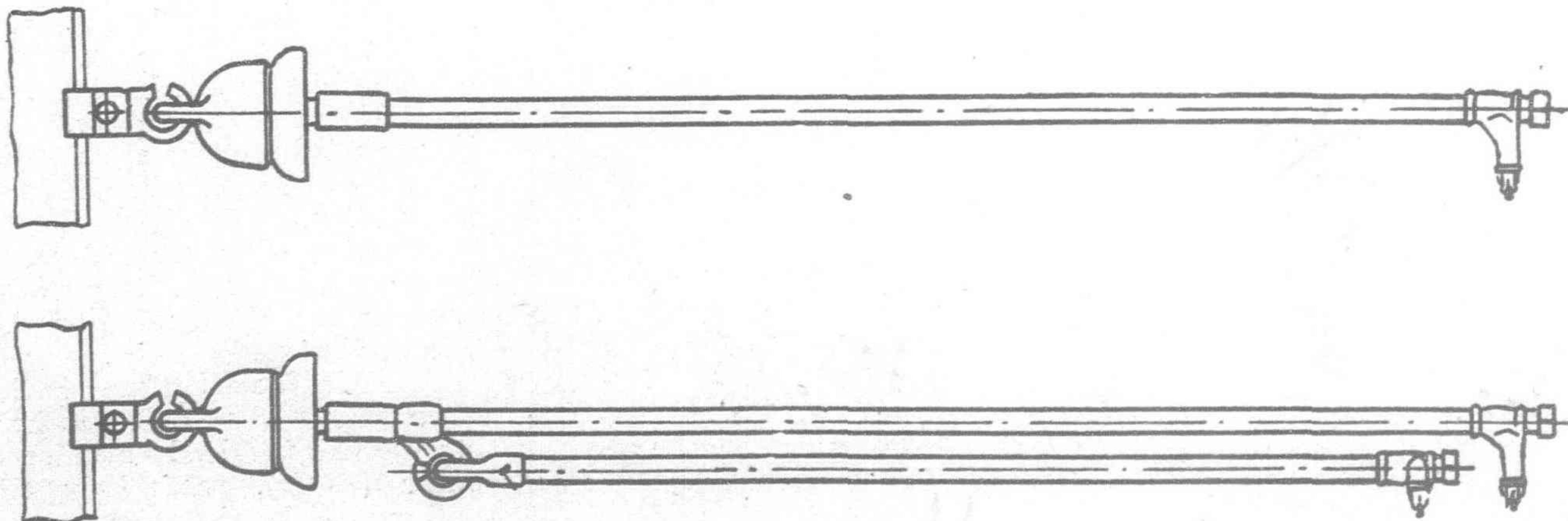


Fig. 9.—Steady arm for contact wire

meets with as little resistance as possible at these points. In order to eliminate the possibility of the collector leaving the contact wire, the latter must be so installed that the collector comes into contact with it everywhere. Of course, the surest

way of obtaining this would be by placing the contact wire exactly over the center of the truck, but this arrangement is for other practical reasons not possible. If it were done, the wire would always remain in contact with the collector at the same point and spoil the contact member by forming a groove in it. To obtain uniform wear on the contact surface of the collector and thus ensure a long useful life of the control member, the contact wire is so installed that the collector in moving from one point of support to the other slides with its whole breadth over the contact wire. With this so-called zigzag installation, the contact wire is staggered with respect to the center line of the track, the zigzag being arranged alternately on each side of the center line (*vide* Fig. 8).

The fixing of the contact wire at the points of support is effected by means of a steady arm consisting of a $\frac{3}{4}$ -in. gas pipe, special clamps and an insulator fastened directly to the pole: Fig. 9 shows the manner of fixing the wire laterally the insulator used in the present case of the so-called Vaupel-ring type. Where local conditions permitted of its being done and where it was not rendered impossible by bridges or by special regulations, the contact wire is installed at approximately uniform height above the surface of the rails, normally 17-ft. 3-in. This was done by suspending it at every 15 to 17-ft. to the messenger cable by means of hangers. On account of the contact wire being supported by hangers at such frequent intervals and owing to the tension in the wire, the sag caused by the weight of the wire from one point to the other is practically nil and the requirement that the contact wire should always be at the same distance from the top of the rails is fulfilled. Fig. 10 shows a hanger, consisting of a flexible copper cable and clumps for connecting the copper cable to the contact wire and to the messenger cable. The messenger cable has a sag, the amount of which depends upon the weight of the cable itself, the weight of the contact wire with hangers, the distance between the points of support and upon the tension due to the anchoring. The

fastening of the messenger cable to the poles must, as in the case of the lateral fastening of the contact wire, be effected through an intermediate insulator.

Fig. 11 shows an insulator as used for the suspension of the messenger cable. The insulator

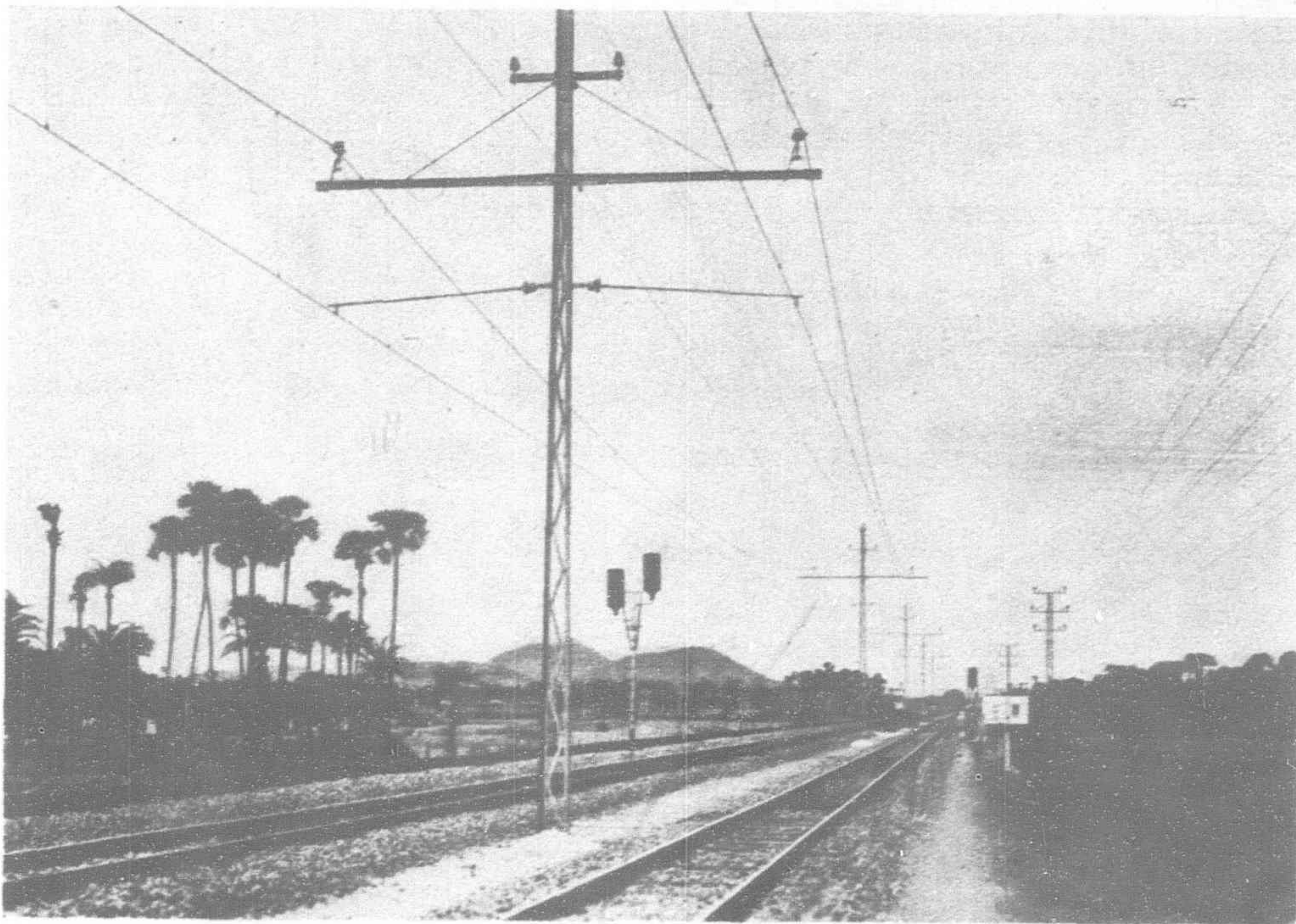


Fig. 5.—Point of support for contact wire on straight section of Madras-Tambaram Line

proper is screwed on to a supporting pin fitted to the bracket arm or the gantry structure by means of a joke. The whole arrangement of the catenary construction is clearly shown in Fig. 5. From same may be distinctly seen how the contact wire is made to remain parallel with the plane of the rails, and how the hangers, according to the sag of the messenger cable, become smaller and smaller the greater their distance from the point of support.

The maximum distance between two points of support on the straight line is 220-ft., this distance being determined, on the one hand by the bearing strength of the steel structure, and on the other hand by the lateral movement of the wire due to wind pressure. Even under the most unfavorable conditions, side-swaying of the wire between two points of support to such an extent that the collector leaves the wire, must under all circumstances be avoided. At curves, the maximum distance between the supports must be made smaller, so that the staggers a and a_1 , i.e. the distances of the contact wire from the center line of the track (*vide* Fig. 12), do not exceed certain limits. The actual distances a and a_1 depend upon the useful breadth of the bow collector; but the distance a_1 may be made greater than the distance a , owing to the

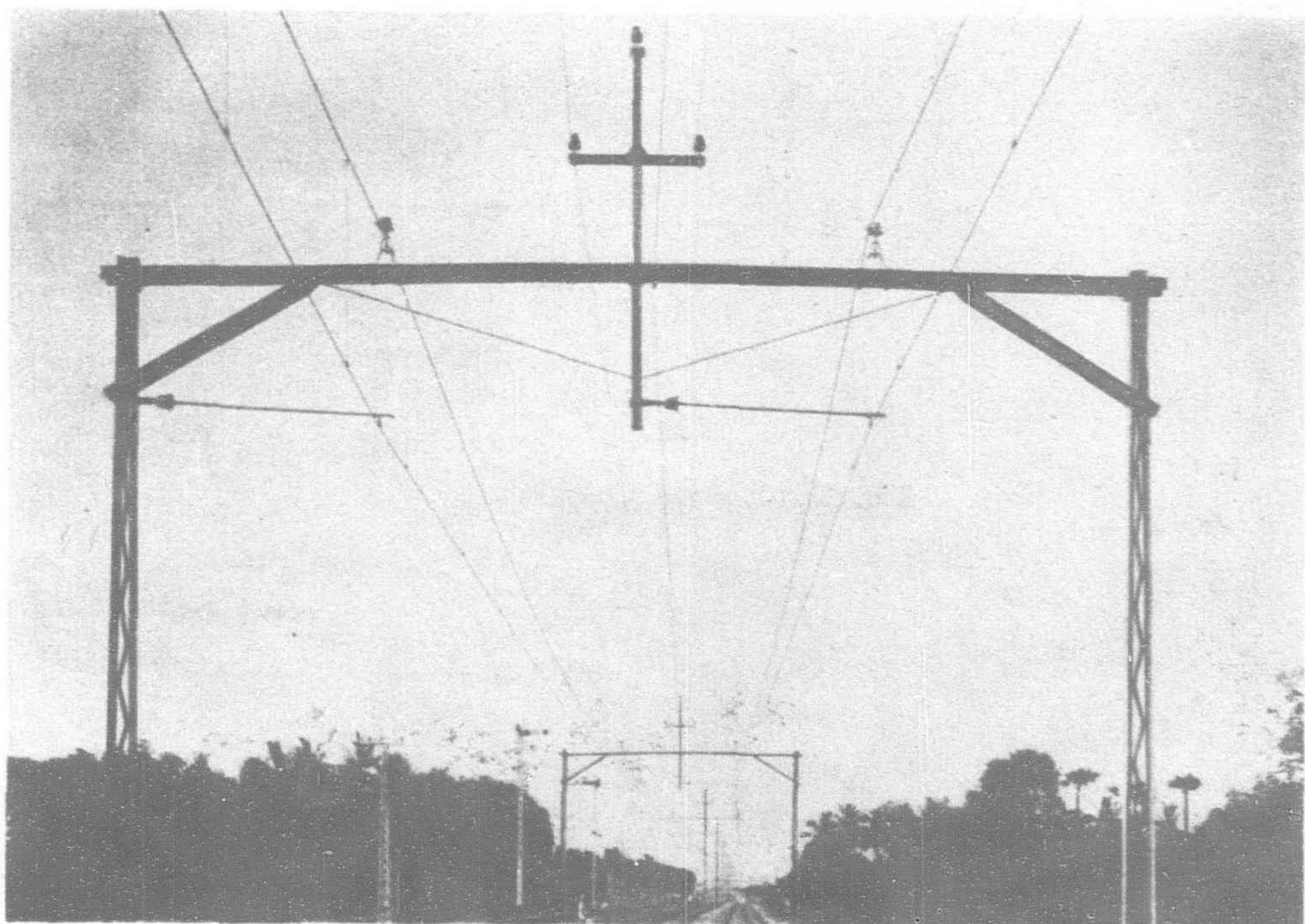


Fig. 6.—Open line: Gantry structure at curves: Suburban railway Madras, British India, direct current 1,500-volts,

contact wire being held in position at the point of support by the steady arm, whereas between two points of support it is liable to be moved to and fro by the wind.

It is evident that both the messenger cable and the contact wire must be mounted with a certain mechanical tension, to give a sufficient stability to the whole system and to enable it to resist

the external mechanical forces, such as wind pressure, pressure of the bow, etc. The contact wire and the messenger cable must, therefore, be tightly anchored at both ends. The tension under which they were installed in the present case was so chosen that under the worst conditions there will still be a safety factor of 3. For anchoring the wires gantry structures, or straining poles, and special fastening members are used, an insulator and a turnbuckle being inserted in the construction. The turnbuckle serves for the regulation of the tension when the temperature varies.

In Fig. 13, the manner of straining the catenary construction is illustrated. The insulators of the Vaupel-ring type, mentioned above in connection with the staggering of the contact wire, were also used for the straining, said type being particularly capable of resisting the pull of the wire. Under normal conditions the contact wire and the messenger cable are anchored at about every 7,000-ft. As at each anchored end of the catenary construction a new section must begin without the passage of the current from the overhead line to the collector being interrupted, a sectionalizing device is

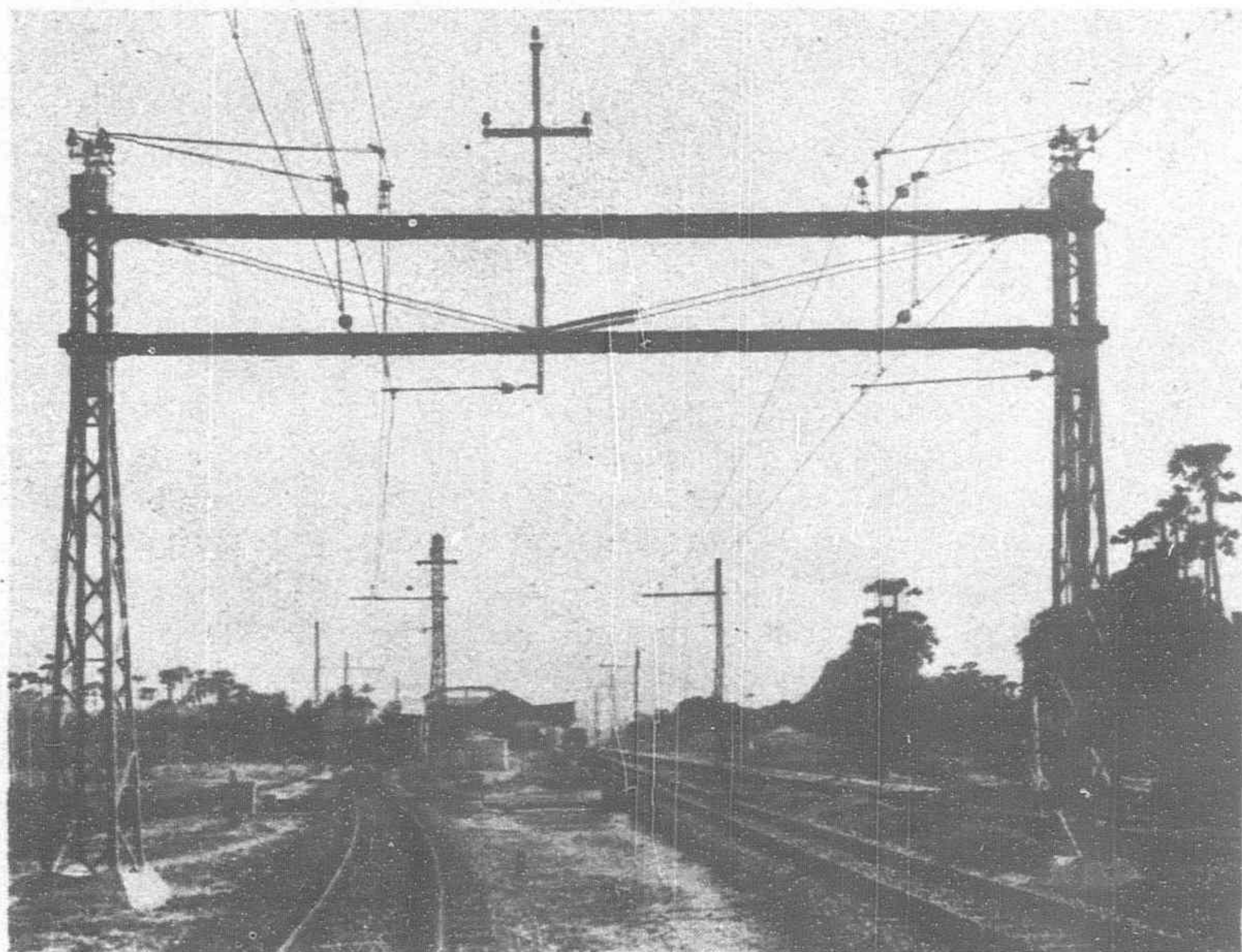


Fig. 7.—Straining gantry structure for two contact wires

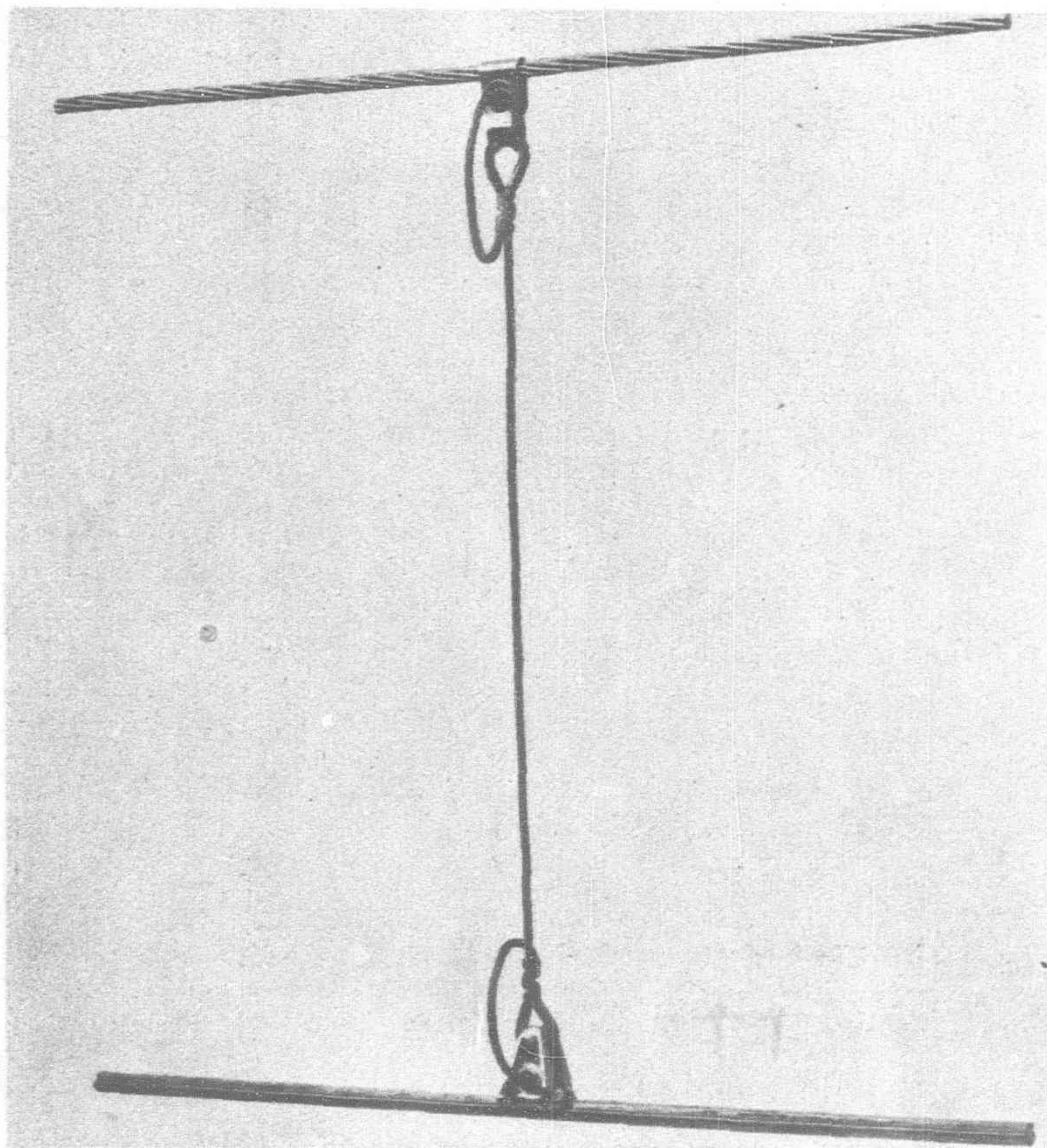


Fig. 10.—Hanger

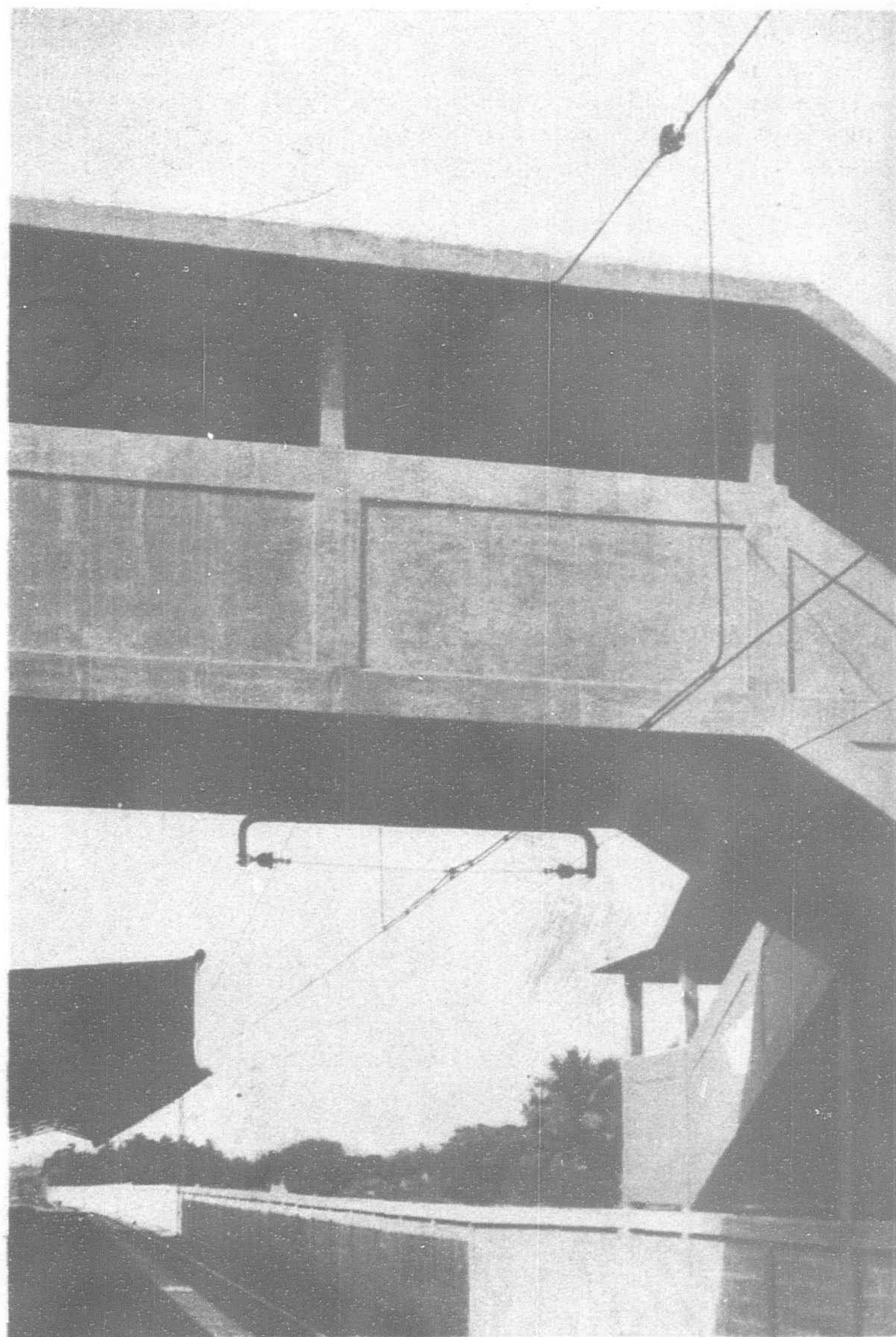


Fig. 15.—Point of support of contact wire under bridges on the Madras-Tambaram Line

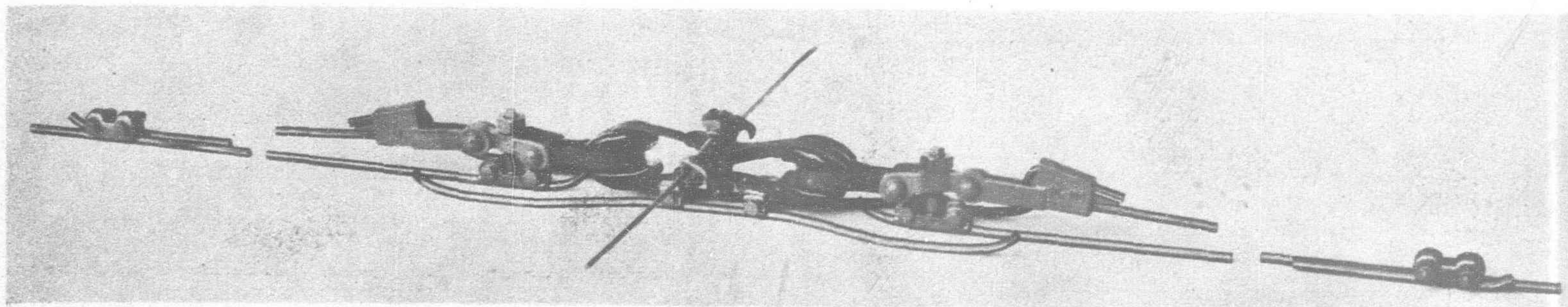


Fig. 14.—Section Insulator

used. With this device the contact wire coming to an end and the new one beginning are so installed that the collector when reaching the middle of the device, where the two ends overlap, slides over from the one contact wire to the other, without any interruption in the sliding path. Besides this general arrangement of the catenary suspension, a number of special construction were, of course, necessary. There are in the first place the electrical connections made between the messenger cable and the contact wire at intervals of about 600-ft., to increase the conductivity of the contact wire through the messenger cable. These electrical connections consist of two stranded copper cables having together a sectional area equal to that of the messenger cable, to which they are connected as well as to the contact wire by means of suitable clamps.

As on the whole line the two main tracks are with respect to current completely separated from one another, section insulators had to be provided in the contact wire over cross-over tracks at each station. Similarly, the contact wires of the goods sidings, which are mechanically fastened to the wires of the main tracks, are electrically separated from the latter wires by means of section insulators. These section insulators are merely insulators inserted in the catenary suspension but constructed in such a manner that the collector passes over the insulators without damaging them or being damaged itself (*vide* Fig. 14). Switches are provided for bridging by means of electrical connections these section insulators

and the sectionalizing devices mentioned above in the case of necessity.

A special construction of the supporting points was necessary for the messenger cable and the contact wire at several bridges. Fig. 15 shows a construction of that kind. The messenger cable on both sides of the bridge is anchored and insulated; the tie rods between the insulators are dead, so that persons passing over the bridge do not run the risk of coming into contact with live parts. The contact wire is so fastened that its movements are limited in all directions to prevent its coming into contact with the bridge and putting it under electrical pressure. Jumpers are used to bridge over the gap in the messenger cable and prevent a diminution of the sectional area of the current-carrying catenary suspension.

Besides the manner of installation of the contact line at bridges just described, in other cases different arrangements had to be made to suit the construction of the various bridges it would, however, lead too far to discuss them all here. A point worth mentioning is that in Madras at the Chetpat station the overhead wire of the tramway line had to be crossed twice. At these two places special constructions were also necessary and were made in such a manner that according as to whether "clear line" is given to the tramway or to the Madras electric suburban railway, the crossing is connected in the one case with the tramway supply network and in the other with the railway supply network.

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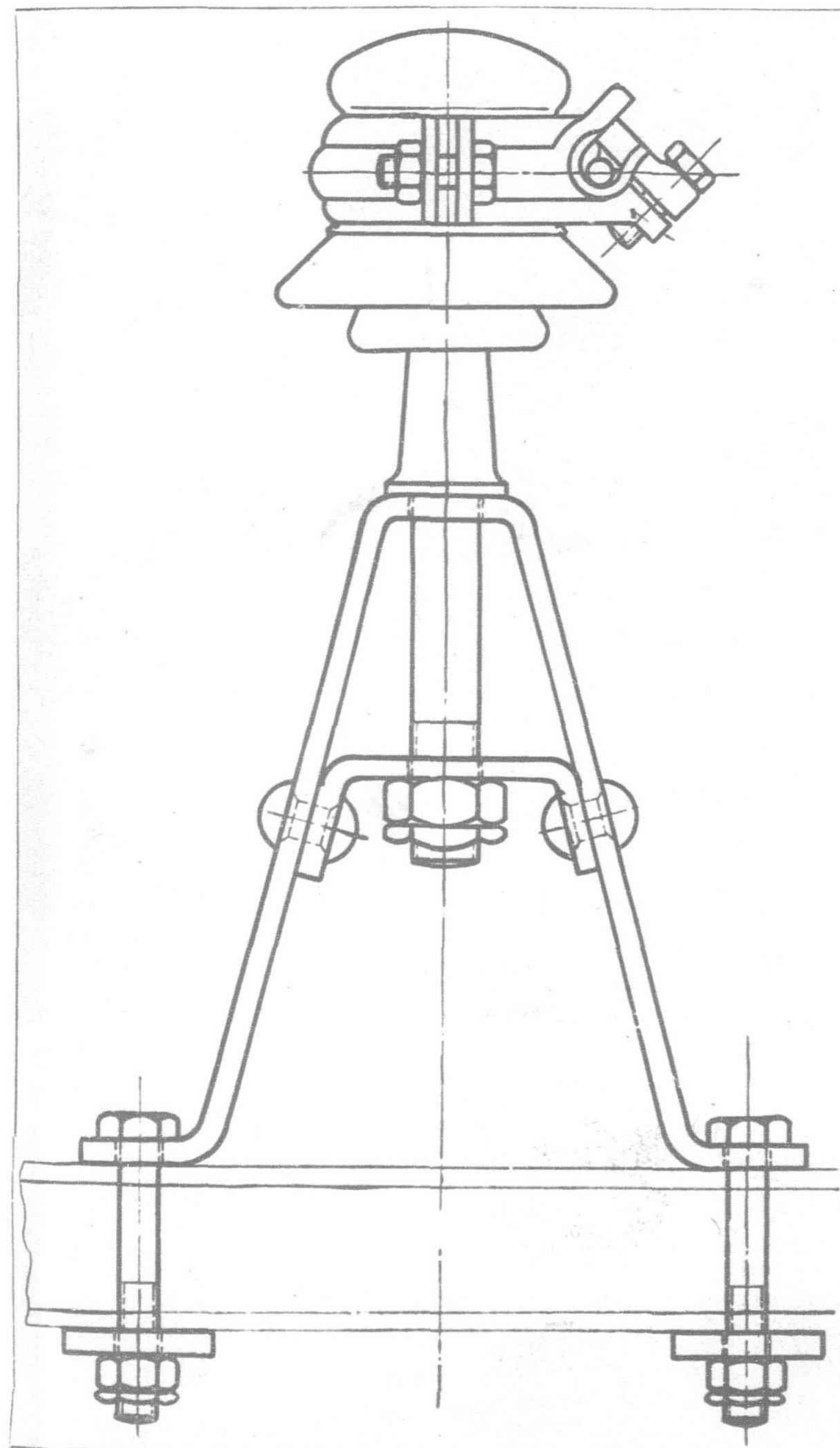


Fig. 11.—Support and insulator for messenger cable

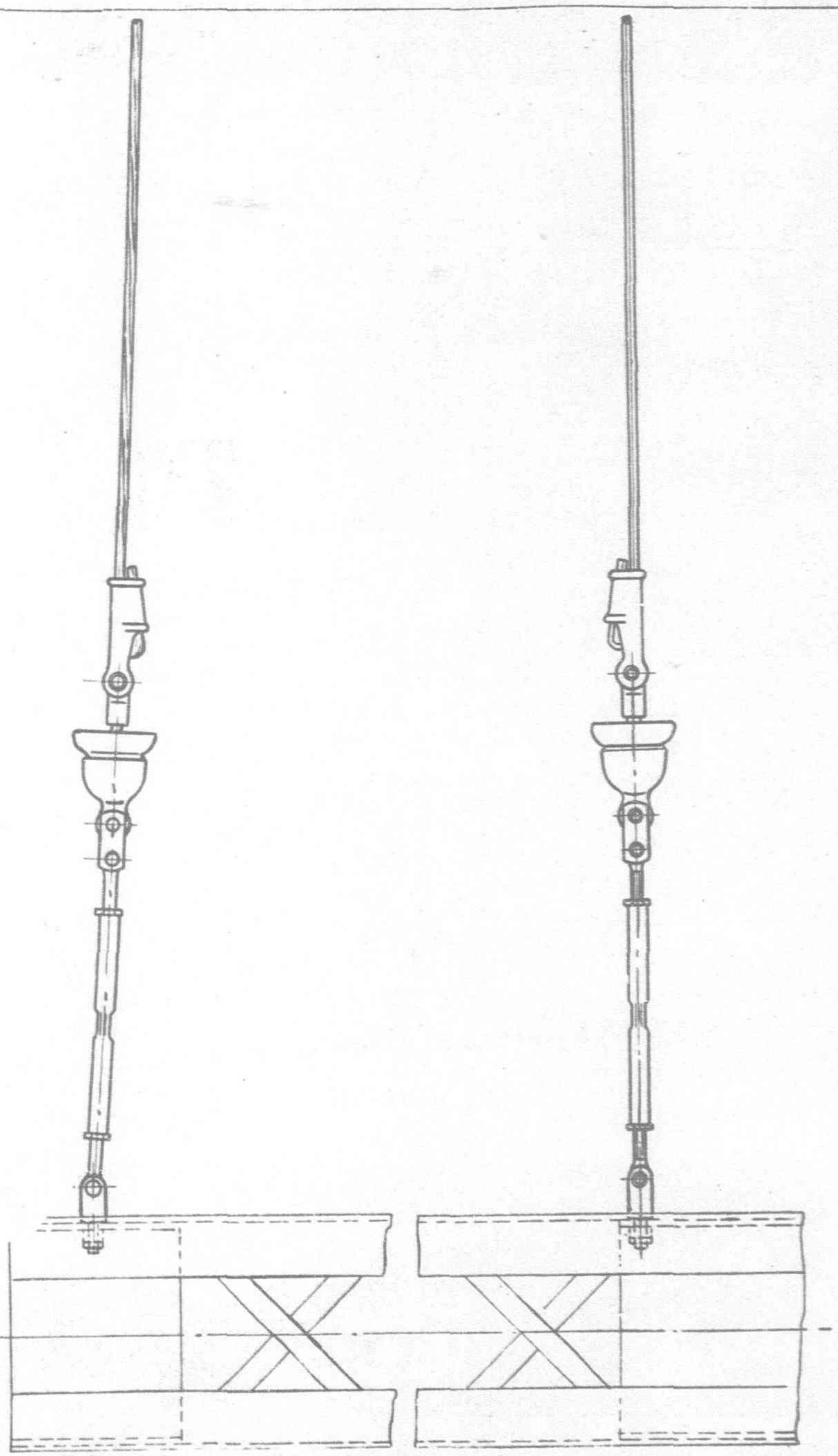
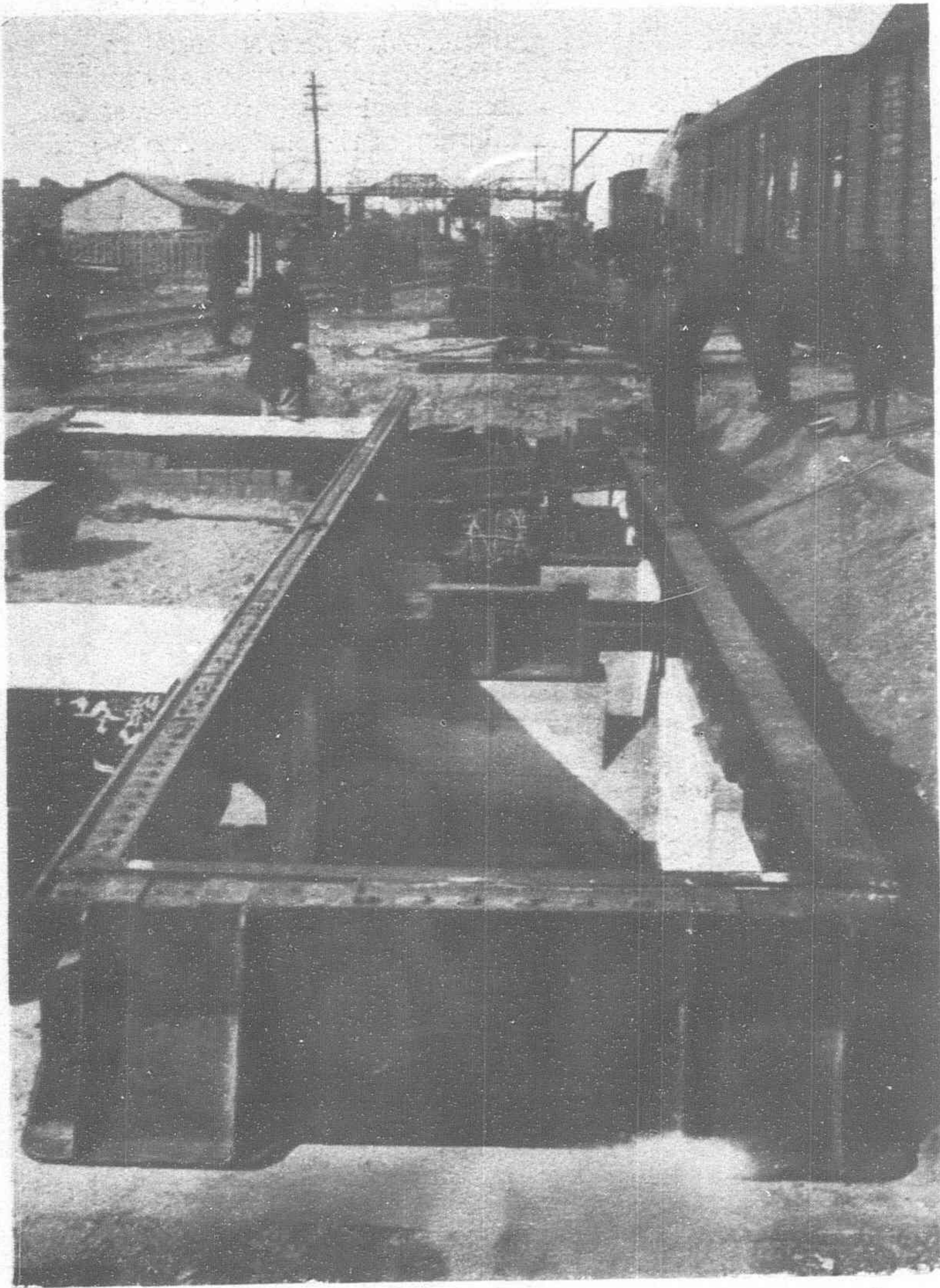


Fig. 13.—Anchoring of catenary construction

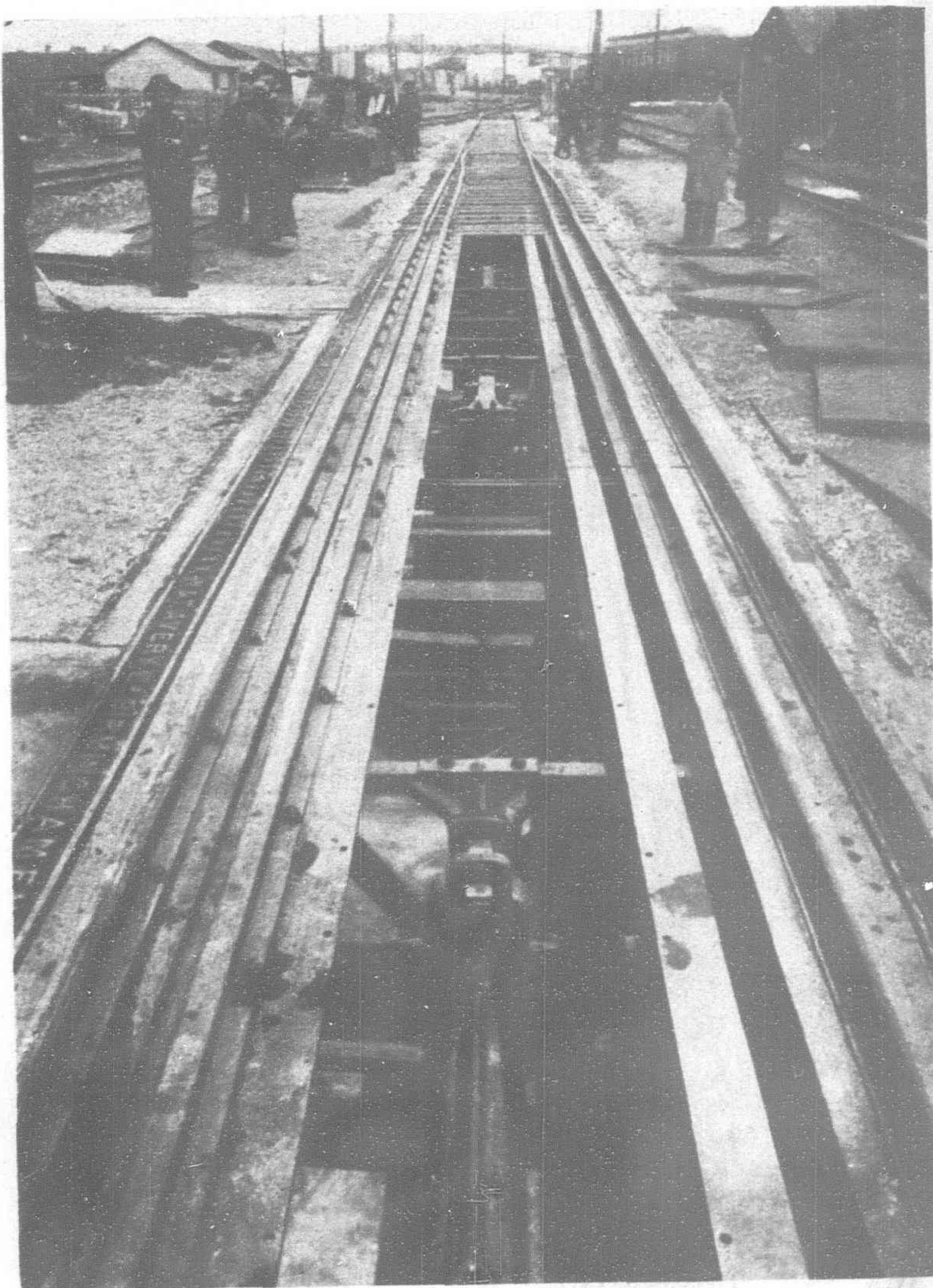
Weighing Trains in Motion on the Kiaochow-Tsinan Railway

WHAT is believed to be the first weighing machine of its type in China has recently been installed by the Kiaochow-Tsinan Railway at Tsingtao. This is an Avery Railway Wagon Weighbridge for weighing in motion trains made up of varying wheelbases.

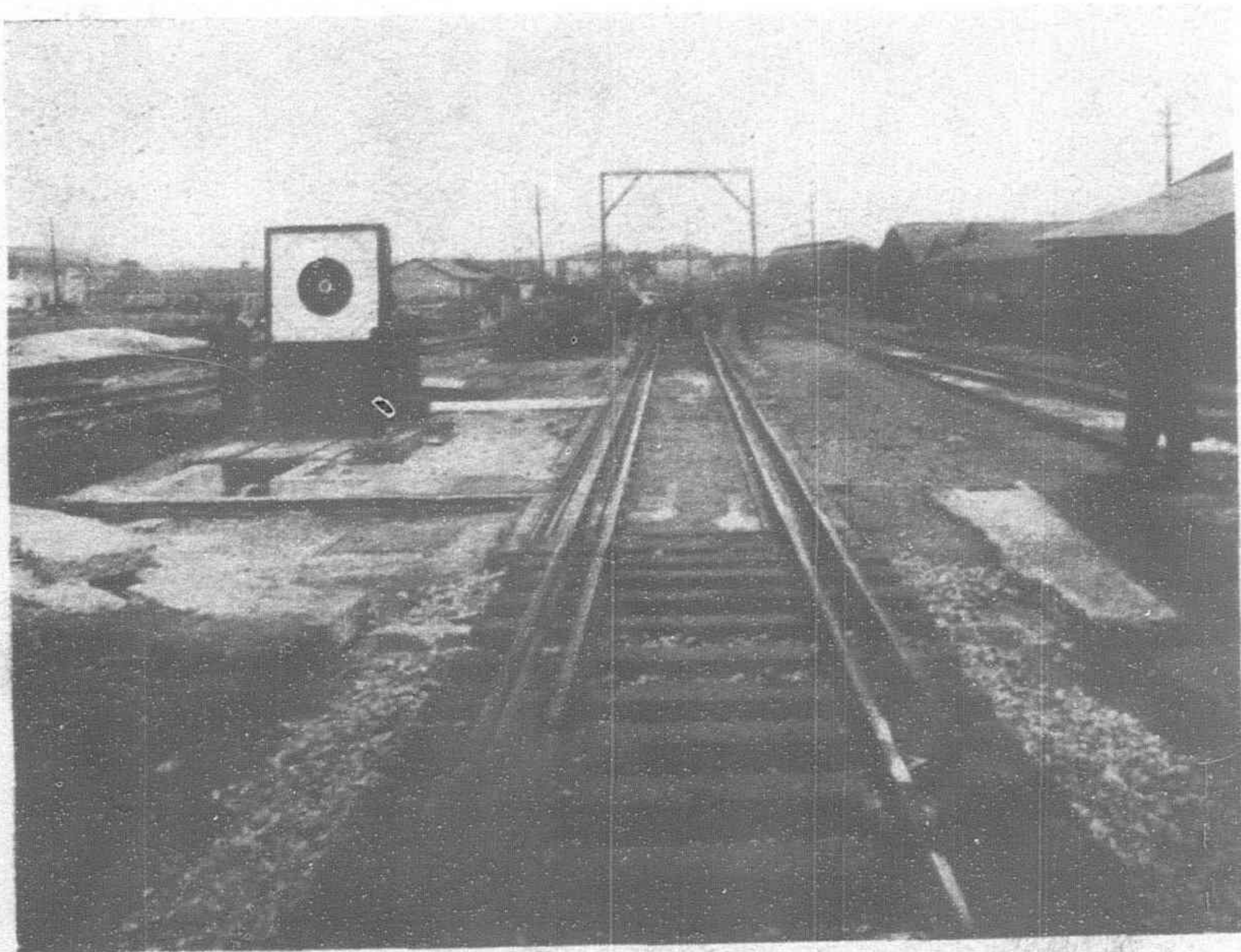
The idea of weighing in motion is by no means new, but it is the first time that the work has been successfully carried out in China, and it gives a further indication of the desire on the part of the Chinese railway officials to work along more efficient and economic lines.—(Continued on page 95)



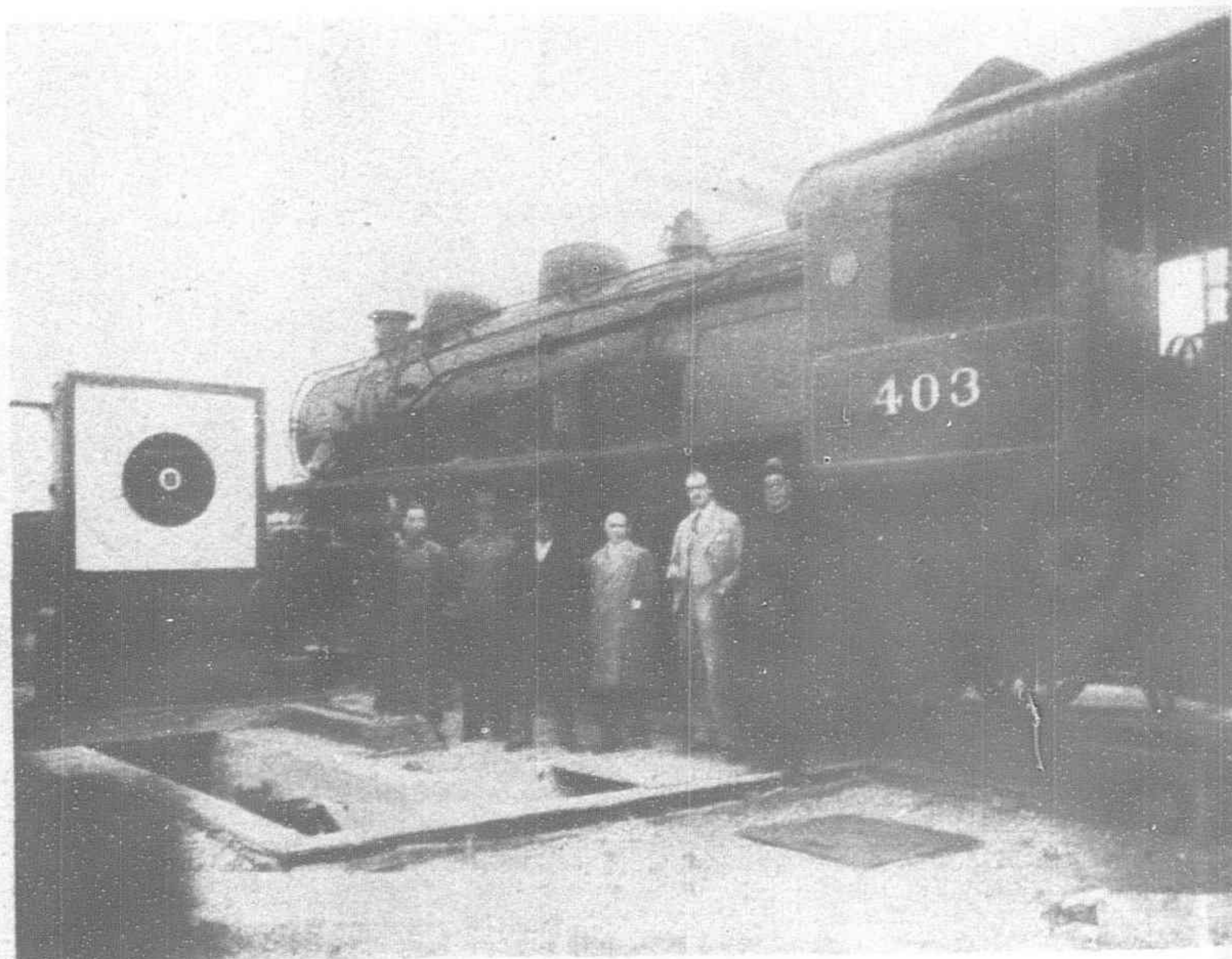
The picture shows the massive cast iron frame during erection. It is from this frame that all the bottom-work levers are suspended, rendering the machine self-contained



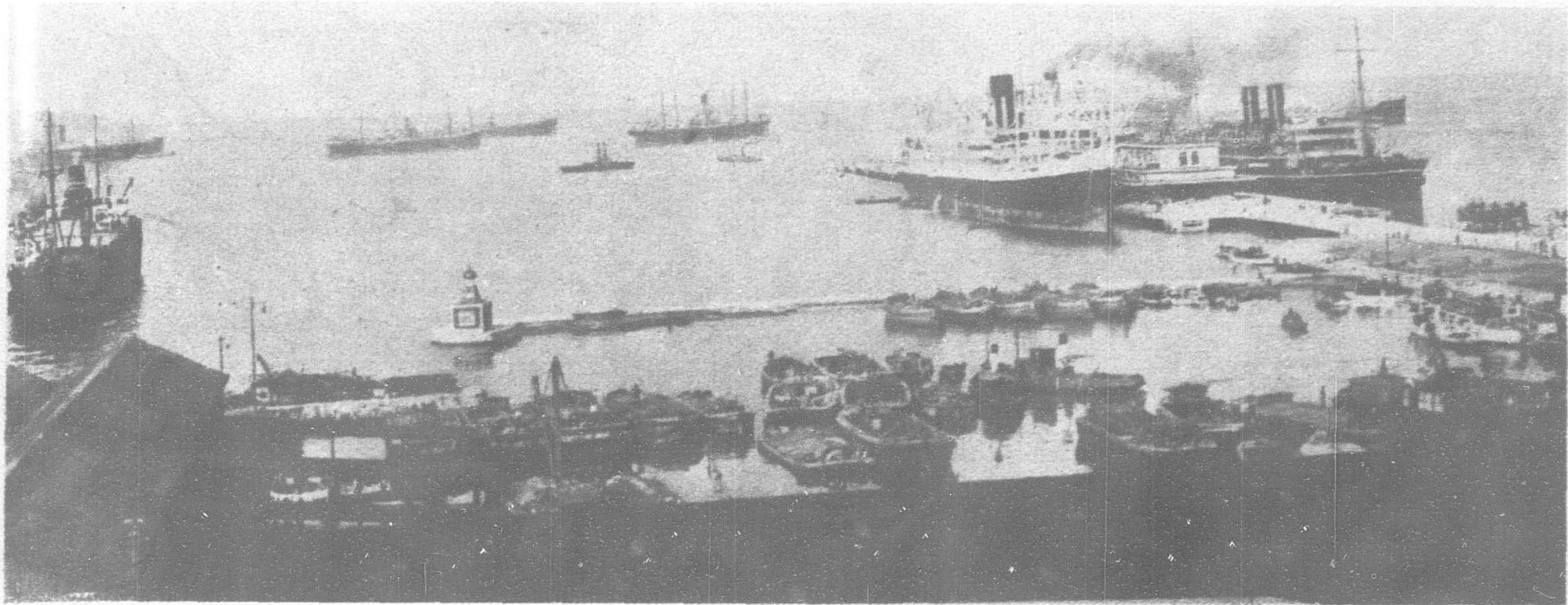
The frame completed and all bottom-work levers and rails are protected. All knife edges and bearings are protected by cups containing grease, rendering them free from corrosion



The weighbridge in readiness for weighing. The dial indicator is fitted with two relieving handles, whereby either or both platforms can be thrown out of gear as and when required



A locomotive on the weighing platform



The Waterfront and Harbor of Yokohama

The City of Yokohama*

THE Port of Yokohama was opened in 1859 as a result of the conclusion of commercial treaties with America, England, Russia, France and Holland. From that time on, its population multiplied and the lines of its streets and its harbor facilities were arranged and improved. In 1923, however, the whole city was destroyed by the Great Earthquake. The citizens made exertions to reconstruct it, and with great foreign and domestic aid, they completed the work of reconstruction in a few years, when the streets, bridges and all other civil engineering works and cultural institutions were brought to greater and more perfect completion. To-day, the city has quite a new aspect. At the same time, the harbor was extended, a mill district was built, and a greater municipal corporation was formed. The City of Yokohama is still growing in prosperity seventy-five years after its opening, and in spite of the greater misfortune of the earthquake.

Harbor Facilities

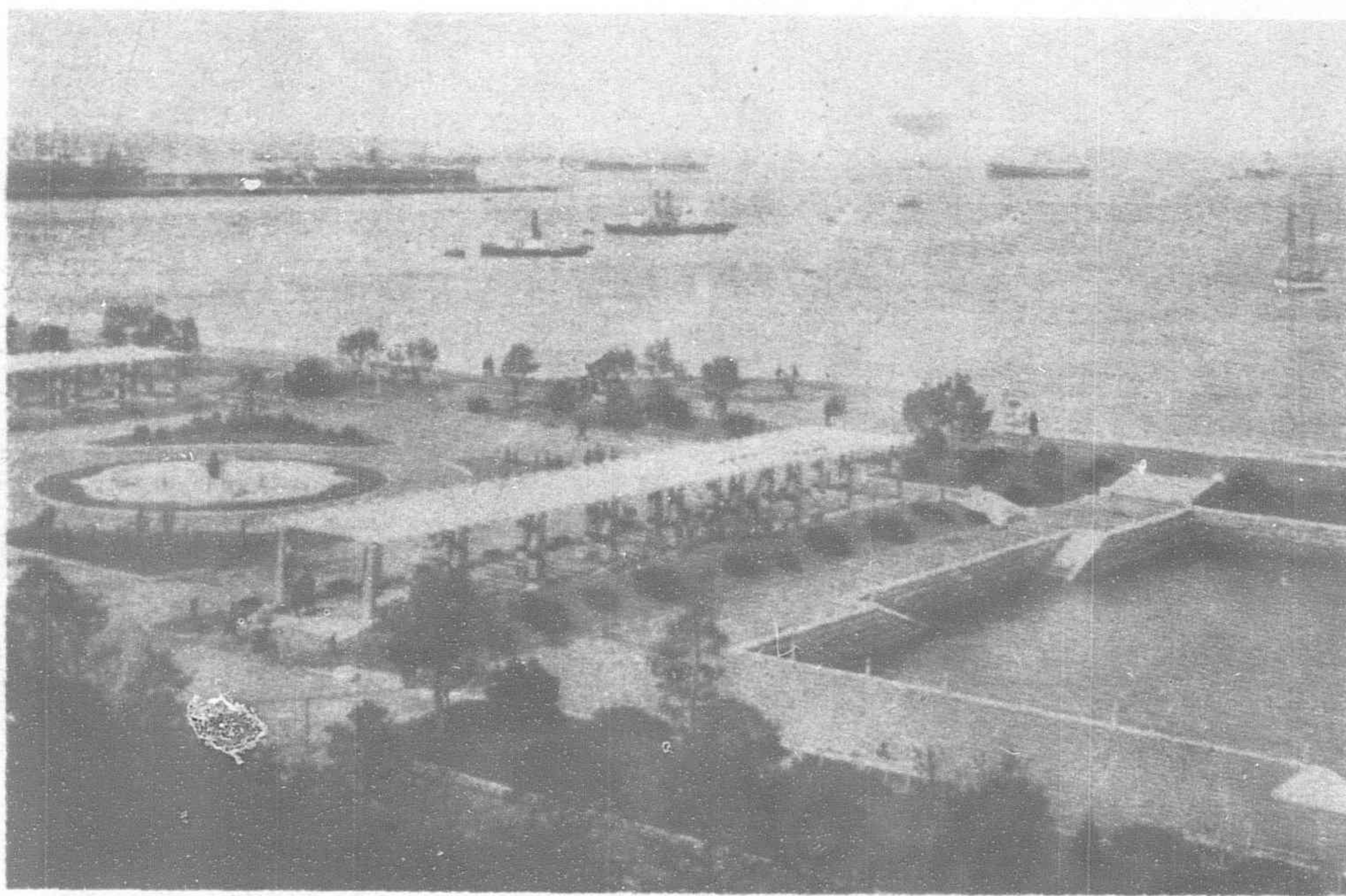
The Municipal authorities from the first, have made it their principal aim to complete the harbor facilities, considering the development of foreign and home trade, through the port, one of the most important duties of the Municipality. The Great Earthquake demolished almost completely the land and water facilities. The work of reconstruction was set about immediately after that, and soon the breakwater, pier, walls, Customs sheds and warehouses were completed on a large scale so as to afford greater facilities than before the catastrophe. The work was not limited to this, but an extension of the harbor was projected and carried out at an outlay of Y.8,300,000 in order to cope with the enhancement of national prestige and the growth of the shipping

trade. A greater breakwater was constructed, and the total area of the harbor limits was extended to 3,539,547 square kilometers. Besides, for coasting trade, a pier, walls, sheds and warehouses were built at a place situated near the railway and most convenient for ship-to-shore service. The harbor of Yokohama is bordered by land in the southern, western and northern directions, and the direction and velocity of the wind, and the difference between high and low tides as well as the condition of the harbor bottom afford good anchorage and mooring. As it lies close to Tokyo, the Capital, the present complete and extended harbor facilities have added much to the convenience of passengers and shippers.

Mill District

A mill district has been built at a place situated most conveniently for sea-to-shore service in the harbor by reclaiming the foreshore for 211.67 square kilometers. The district is divided into three parts, which are connected by a canal, with streets running in all directions, and a railway, to say nothing of the provision of waterworks, gas and electric power and other cultural facilities.

The Municipality in building the mill district, has made it its chief object to develop local industry, and never bent on profits. So, the land is transferred at actual cost and with special Municipal tax exemption for a fixed period. Many applications have been received for sites, taking advantage of the privileges and thinking the place unequally convenient for operating mills, with a wharfage accommodating 10,000 ton ships, which can load and unload cargoes everywhere, the land nearing Tokyo and adjoining a very good residential section.



Yamashita Park, Yokohama

*The Japan Magazine.

Timber Yards

Yokohama is the largest port for importation of foreign and domestic woods. Timber yards have been set up over an area of 16.4 square kilometers at a point contiguous to the great breakwater, free from the wind and sea and not obstructing ships going in and out. The sites may be used additionally for saw-mills. Facilities for conveyance of timber are also at hand. The work of construction has been just completed.

The Silk Conditioning House

Raw silk, which is the most important of Japan's export products, is shipped through Yokohama for the most part. There is, therefore, a National Silk Conditioning House established in the City, where the conditioned weight and classification, testing of export silk, is conducted, and research is made of raw silk. Its main building is four storied and covers a total area of 8.432 square kilometers.

Silk fabrics are next in importance to raw silk in Japan's export products, and the larger portion of the trade is carried through Yokohama. So, there is the National Silk Experiment Station, where researches and investigations are made of silk reeling and weaving so as to improve the quality of silk fabrics. Its main building is three storied and covers an area of 4.634 square kilometers.

Hotel New Grand

The Great Earthquake inflicted extensive damage on the local foreign residents, whose dwellings and offices were lost. Moreover, the hotels were also destroyed or burnt down. In order to avoid the great inconvenience to foreigners and considering the future resuscitation and prosperity of the City, the Hotel New Grand was built



The Yokohama Commercial and Industrial Museum

by the Municipality on the bund. It is a magnificent and pleasant building, made in a combination of foreign and Japanese styles. It is always occupied to capacity, and an extension is being made.

Municipal Commercial Rooms

This hall was built for the purposes of exhibiting all kinds of foreign and home trade goods for inspection by foreign and Japanese visitors, and to afford them help in buying, of serving to connect and control the Trade Guilds and Associations in the City, lending the rooms for the introduction or exhibition of some particular trade product. The building is near the Pier and easy of access. The number of visitors is increasing.

Municipal Enterprises

The chief enterprises of Yokohama Municipality are waterworks, gas, electric, hospitals and market businesses.

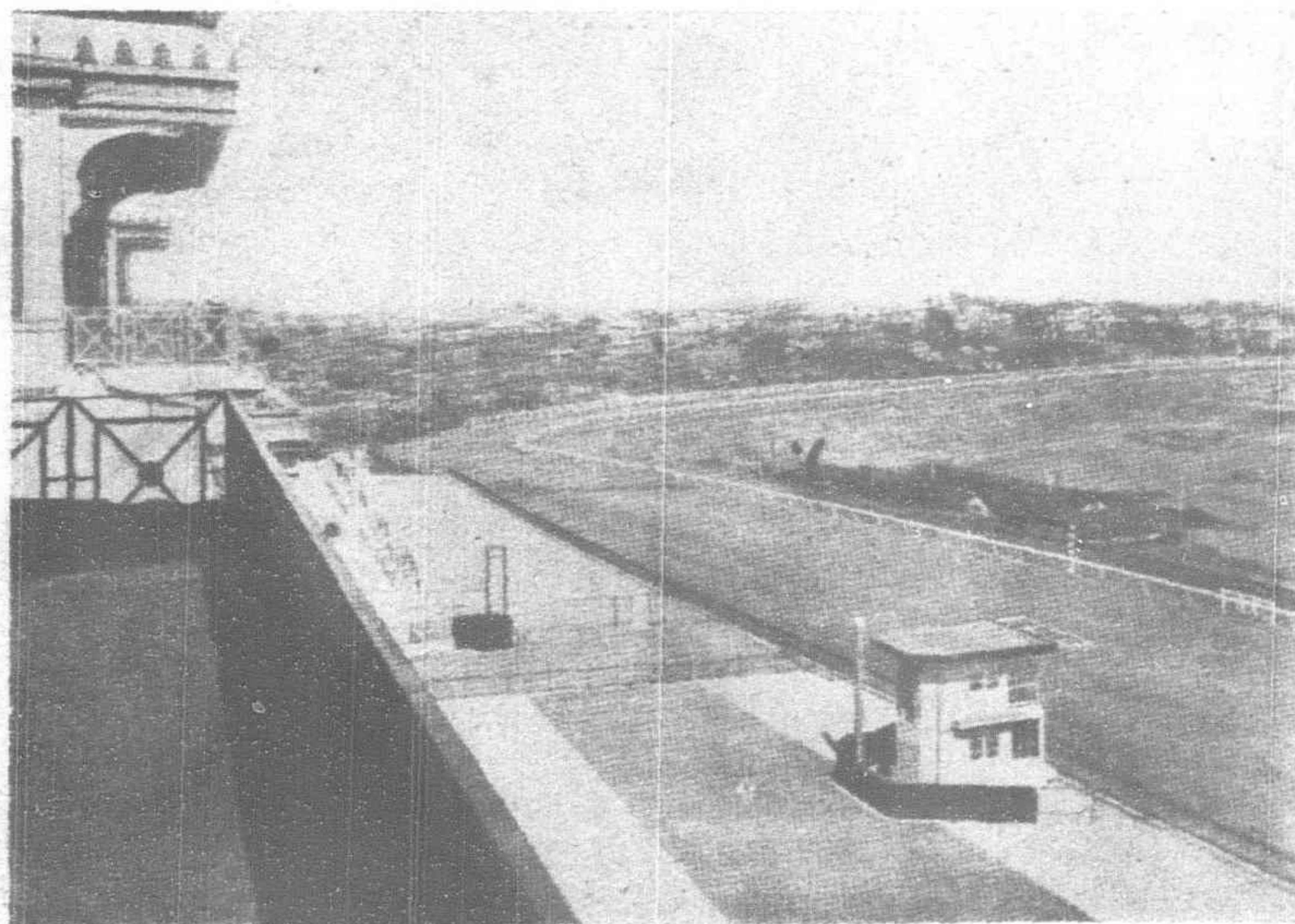
Waterworks.—The Yokohama waterworks are the first of the kind in Japan. The collecting-ground is about 50 kilometers out of the city. After the Earthquake, the equipment was much enlarged. Later, an extension was made to provide for the future, when the population of the City comes to 1,000,000. The extension work has not been finished.

Yokohama has the honor of being the first to commence gas works among the cities of Japan. After the Earthquake, the works, were improved and perfected. An extension is being carried out with a view to supplying gas to the new residential quarters outside the City.

The electric business of Yokohama consists in running electric tramway cars. After the Earthquake, new lines were opened, and the present total mileage extends over 47 kilometers. There are Municipal motor-buses run in the city as an auxiliary to traffic service in the city.

The hospitals owned by the Yokohama Municipality are the Juzen Hospital, a general

(Continued on page 89)



Negishi Race-course of Japan Race Club



Kanagawa Prefectural Office, Yokohama

The City of Nagoya*

Its Activities and Attractions

By H. KONDO

THE City of Nagoya was founded in the 15th year of Keichi (323 years ago) by Lord Yoshinao Togugawa; and even before the Meiji Restoration in 1868 it was a thriving commercial and industrial center, ranking next in importance to Yedo (now Tokyo), Kyoto and Osaka, as succeeding lords made it their policy to foster and encourage productive industry in the locality. But the development of Nagoya as a truly modern commercial and industrial city has been only in the past forty or fifty years of Japan's capitalist-economic system. Yet the industrial development attained in that comparatively short period is really marked and wonderful.

Center of Industry

Its great productive and consumptive background, its honest, diligent and talented labor in abundance, its cheap water power, its mild and suitable climate, its naturally salubrious weather and its most advantageous and convenient sea and land traffic facilities all furnish unlimited power for its development. Nagoya is thus the third city of international importance in Japan, coming only after Tokyo and Osaka; its population now reaches 1,060,000. In 1928 its industrial production reached a value of Y.400,000,000. Even to-day, when trade is generally dull and commodity prices show a decline, the annual value stands at Y.250,000,000. All sorts of industries are carried on there; above all, spinning,

weaving, woollen textile and pottery industries have their national center in Nagoya, where the products are so fine in quality and cheap in price as to make it hard for manufacturers in other places to compete. To see statistically the truth of its industrial development, the following comparative table of its industrial production in value may be interesting:

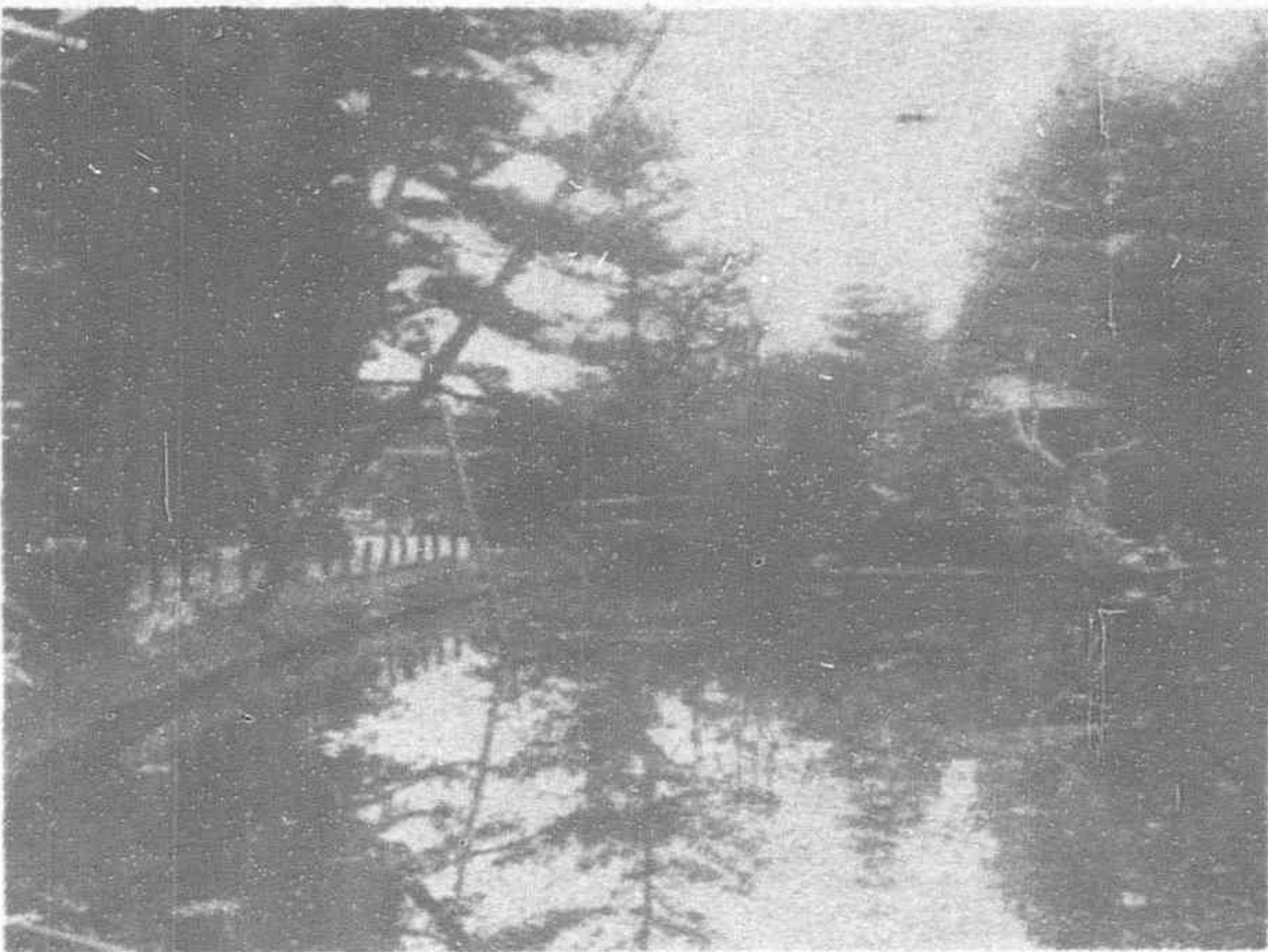
Year	Industrial Production Yen	Percentage of Increase
1921	207,657,303	100.00
1925	333,254,436	160.48
1928	397,660,107	191.50
1931	242,288,642	116.68

In 1931 industrial production in Nagoya was greater in value by only 16 per cent over 1921. This was, of course, owing to the international trade depression, which caused a decrease in the demand and a fall in commodity prices. In the meantime, however, the chief industrial products in the locality were on the increase. The following figures show the local industrial products, each

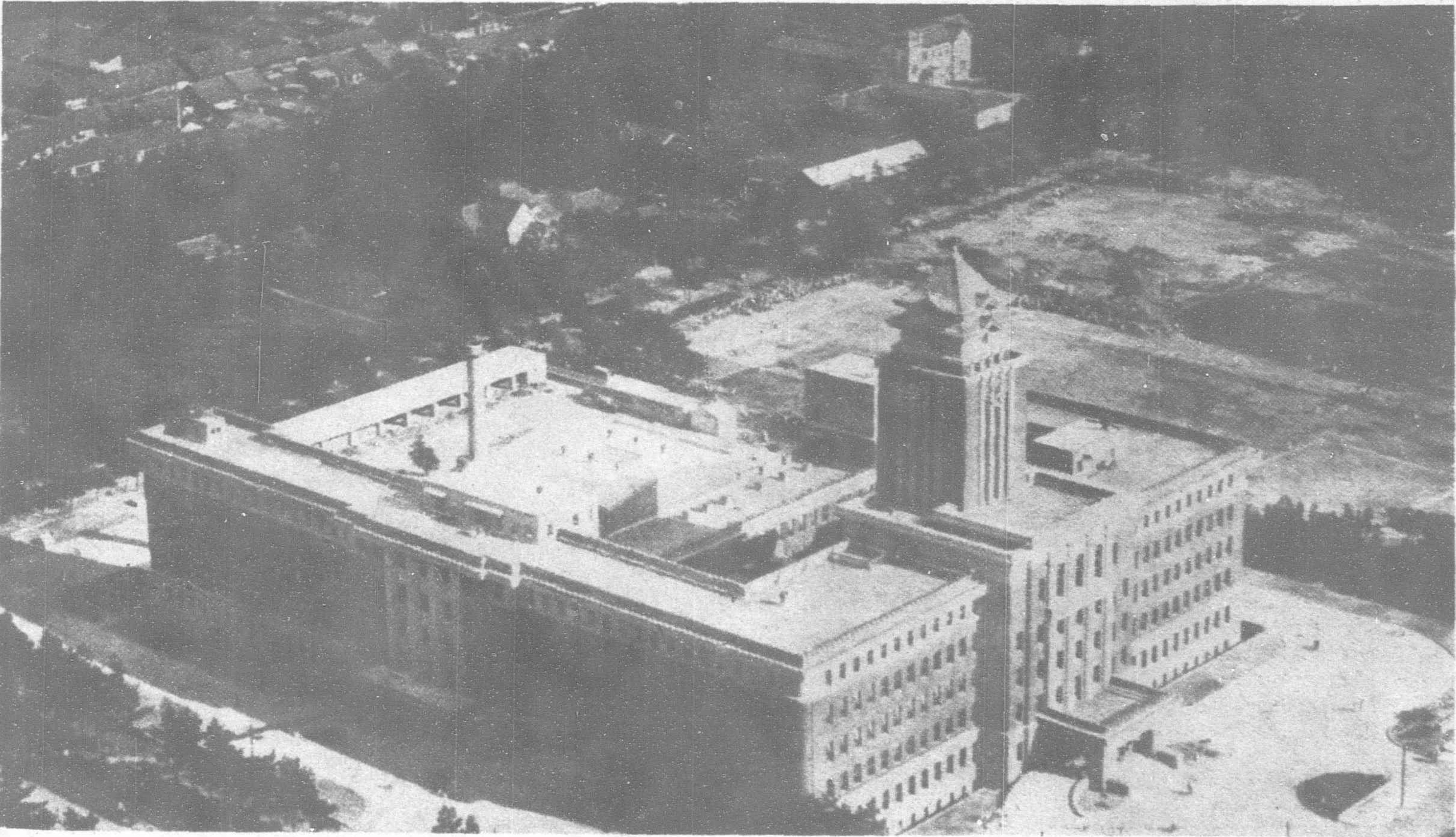
of which comes to a yearly value of not less than Y.10,000,000:—

Product	Value Yen	Product	Value Yen
Cotton fabrics ..	50,666,660	Cotton yarn ..	28,695,154
Pottery ..	15,518,982	Raw silk ..	12,863,296
Woollen fabrics ..	10,829,177	Confections ..	10,603,000

*The Japan Magazine.



Tsurumai Park, Nagoya



New Nagoya City Office Building

Important in Trade

Naturally, this remarkable industrial development has stimulated trade expansion in the city, which is an important center of traffic for Central Japan. This fact, coupled with a marked growth of local demand for commodities consequent on a rapid increase in the population, makes its commerce very prosperous. Especially, has its foreign trade, under more complete harbor facilities in the port of Nagoya and an unequally heavy decline in the foreign exchanges, attained remarkable headway, and reached a value of Y.130,000,000 in 1932, which increased to Y.200,000,000, at least, in 1933. Its yearly ratio of increase surpasses that of any other port in Japan.

Of the foreign trade of Nagoya, the chief exports are cotton fabrics with a yearly value of about Y.30,000,000. Next in importance comes pottery valued at about Y.18,000,000; followed by beer, box and cask boards, cotton yarn, wheat flour, rock sugar, glassware, ironware, spinning and waving machines, veneers and clocks. Besides, there are woollen fabrics, the export trade in which is expected to increase with interest and confidence. Of imports, wool comes first, valued at about Y.27,000,000; and next come wheat, coal, fodder and lumber.

The port is crowded more and more with shipping especially since its elevation to the position of an international trade harbor. It now stands as an important point in the international transportation net. Its harbor facilities show the most modern improvements, and in five years more the area will be further extended so as to accommodate at the same time sixty-six ships of not more than 10,000 tons each. In consequence, the foreign trade of the city is being carried more and more directly by the local merchants, taking it over from the hands of the Osaka, Kobe and Yokohama merchants, who have hitherto principally handled it. This direct foreign trade, it is believed, will show further strides hereafter.

People say that one cannot get an idea of the modern industrial motive power of Japan, without visiting Nagoya and seeing its industry. This is no exaggeration.



Nagoya Castle

History and Culture

Nagoya does not feature simply as an industrial city, but also in culture it is a power in a triangular position with Tokyo and Keihan (Osaka and Kyoto).

Oda Nobunaga and Toyotomi Hideyoshi, heroes of old Japan, and Tokugawa Iyeyasu, their successor, and the founder of the Tokugawa régime, which lasted three hundred years, were born in or near Nagoya, where their families held vassalages from old times; and so the place was made the center of culture for the neighboring districts. There are still old customs surviving there, and many places of historical interest.

At all seasons the City has plenty of visitors, attracted by its recreation and other facilities, provided more and more with the enhancement of its culture as a modern city and by the national places of interest in and out of it.

Places of Interest

The following are the chief places of interest in the City:

Nagoya Castle.—Nagoya Castle was built by Tokugawa Iyeyasu in the 15th year of Keicho (1601) by allotting the work to feudal lords. For the subsequent three hundred years it was occupied by Lord Owari. After the Meiji Restoration, it was partly used as a military garrison and partly as Nagoya Palace. In 1930, the Palace was transferred to the Nagoya Municipality, and is now thrown open to public inspection.

This grand completely wooden structure with a history of three and a half centuries is famous in Japan as a national treasure, with its valuable collection of fine art. Its sliding-door pictures are by great Japanese artists at the most consummate period of Japanese painting; and it may be called, therefore, a great gallery of art technology.

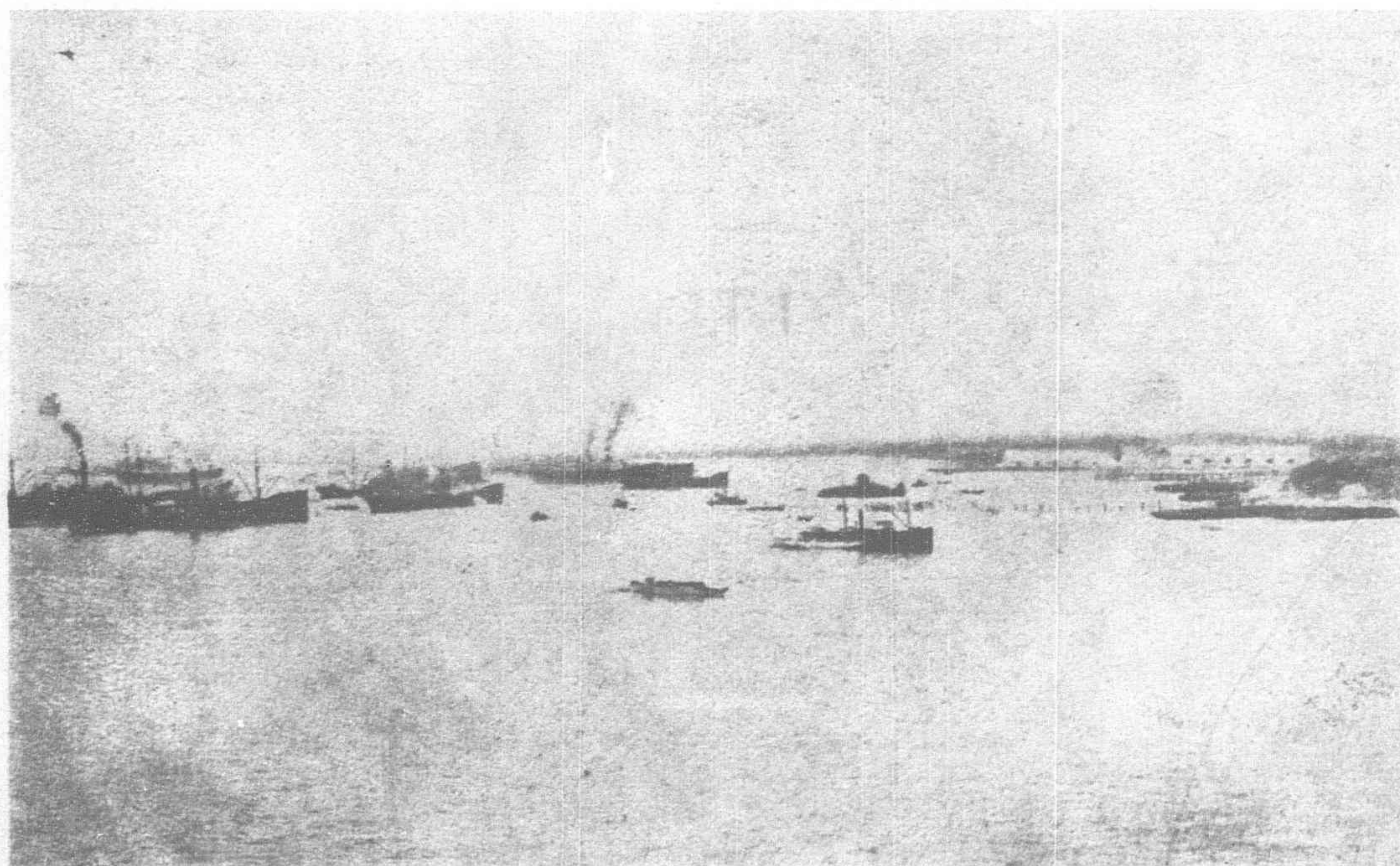
Atsuta Shrine.—The Atsuta Shrine is sacred to the Kusanagi-no-Tsurugi, a sword which is one of the Three Sacred Treasures of the Imperial Court. It is very old, and a center of national veneration, as the Ise Shrines are.

Tsurumai Park, Buntenkaku, Public Hall and Sarumen-jaya.—

Tsurumai Park was laid out in 1910 in commemoration of the holding of an Exhibition on its grounds. It is a level garden of modern type, and presents fine scenery in woods and ponds. The Buntenkaku is a very elegant two-storied building with a balustrade of the Muro-machi type: it is used in entertaining guests of honor visiting the City. It is situated in the south-eastern part of the Park, facing the Public Hall, another fine four-storied building in the north-western part of the Park. The Sarumen-jaya, situated beside the Buntenkaku, is noted as one of the three most famous tea-ceremony houses in Japan. It was erected and used by Lord Oda Nobunaga in the sixteenth century.

Nakamura Park.—Nakamura Park is located about two miles westward of the City, and is known as the birth-place of Lord Toyotomi Hideyoshi, a military hero at the end of the sixteenth century.

New Municipal Building.—The new Nagoya Municipal Building was erected in commemoration of the Imperial



Nagoya harbor and its wharf

Enthronement, at a cost of Y.3,000,000. Its construction work was commenced in November, 1931, and completed in September, 1933. It is a six-storied edifice of a modern earthquake-and-fire-proof structure, designed after Japanese taste. It is one of the biggest buildings in the City, like Nagoya Castle.

Nissenji.—The Nissenji, or Nissen Temple, is situated on Kakuo-zan at the eastern side of the City. It is sacred to the name of Buddha, enshrining his gold image, presented by Siam. The grounds are spacious and command fine views.

Branch Temple of the East Honganji.—The Branch Temple of the East Honganji was built in the Genroku era (about 230 years ago). It is a splendid example of that age, built of selected woods.

Osu Kwannon and Nanatsu-dera.—The Osu Kwannon Temple was erected in the Keicho era (about 300 years ago) and belongs to the Shingon sect. It shelters the famous Osu Library. It is a pleasure resort, nearly as bustling as Asakusa Park in Tokyo, and Sennichimaye in Osaka.

The Nanatsu-dera is a temple founded by Priest Gyoki in the Tempei era (about the 8th century). It has valuable Buddhist images sacred books and old manuscripts. Its main building and the three-storied building in front of it are specially protected by the State.

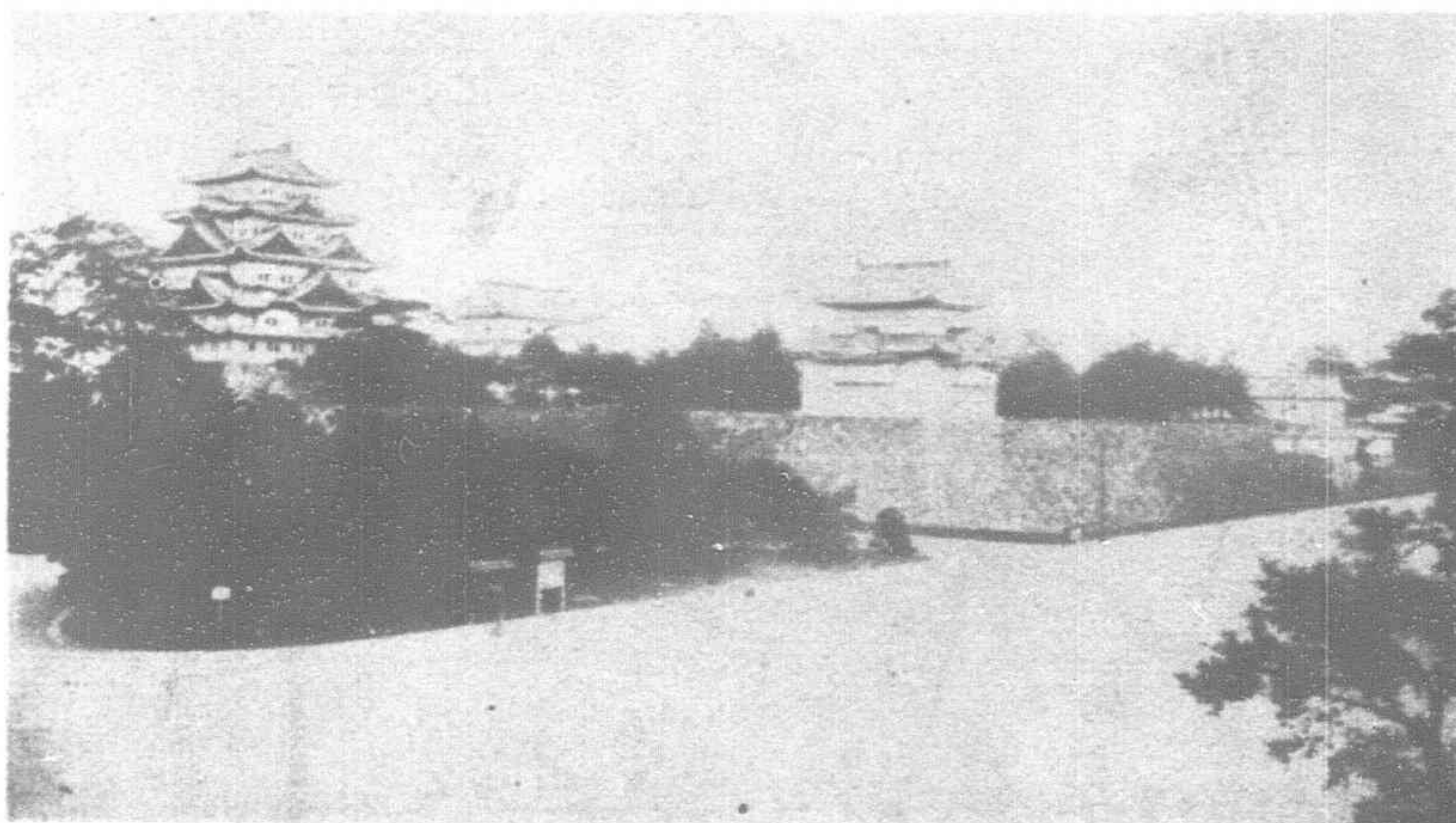
Nagoya Golf Links.—Nagoya Golf Links are located at Wagonmura in the eastern suburbs of the City, which can be reached in about thirty minutes by automobile. There is a tasteful Club House standing in a pine wood on a hill.

Noted places in the vicinity of Nagoya are:

Kaba-gori.—This is a noted



A view of Nagoya City



General view of Nagoya Castle

sea-bathing place lying along the Main Tokaido Line. A magnificent international tourist hotel is being built there in foreign and Japanese style.

South Chita Beach.—This is a place of fine scenery and a good sea-bathing suitable for the amusement and health of the citizens.

Nippon Rhine.—The Nippon Rhine is a name given to part of the Kiso River and is one of the new Eight Fine Views of Japan, and affords a fine boat trip. There is a tradition that Momotaro, the hero of one of the most popular juvenile stories of Japan, visited there.

New Shantung Highway

The Weihsien-Taiorchwang Highway, in southern Shantung, is fast nearing completion, and will be opened for traffic when the last two bridges will be ready.

At a recent meeting of the Shantung Provincial Government, it was decided to authorize the Provincial Department of Reconstruction to purchase ten motor-buses which will be used on this road. Motor-traffic will bring Weihsien within one day of Taiorchwang.

This new highway is approximately 160 miles long and traverses an area in southern Shantung which was previously almost devoid of modern means of communications. With existing connections with other highways, this new road will bring the Kiangsu border (at Taiorchwang) nearer to Chefoo, on the northern Shantung coast, by reducing the rail journey one day.



Atsuta Shrine, sacred to one of the three treasures of the Japanese Imperial House

Economics of Electric Resistor Furnace Design and Construction in Japan*

By JAMES A. RABBITT, Adviser to Japan Nickel Information Bureau, Tokyo

PART ONE

SUGGESTIONS are made in this paper for methods of (1) insulation and (2) wiring with the most efficient alloys for resistor elements, in relation to design in electric resistor furnaces.

The economy thus effected is shown with the object of extending the use of the electric resistor furnace into new fields, as well as increasing its use in the older fields of industry.

Advantages of Electric Heating

Safety, convenience, reliability, and cleanliness, are prime advantages, but for industry the advantage of accurate control is of utmost importance to the quality of the product to be heat-treated.

General Advantages

Some of the outstanding general advantages of electric heat are :

- (1) Greater flexibility of application : that is it can easily be developed at, or adjacent to, the point of use more readily than other forms of heat.
- (2) It is easier and more accurately controlled by time, temperature and heating cycles.
- (3) Lower temperature gradient between heat source and point of use, that is, in other forms of heat using flame the temperatures are often 1,000 to 2,000° F. higher than working temperatures required, whereas the electric element temperatures may be kept at slightly higher than working temperatures.
- (4) Higher relative efficiency : that is, more of the heat developed can be utilized efficiently than where fuel is employed.
- (5) Eliminates smoke, grease, dirt, ashes, moisture and fumes and other products of combustion.
- (6) Requires less time and attention in operating and maintaining apparatus.
- (7) Eliminates fire and explosion risk. Its use frequently reduces insurance risk.
- (8) Makes more comfortable, convenient and, healthful living and working conditions for operators.
- (9) Minimizes or removes entirely furnace noises.
- (10) Improves the product or process and reduces the number of rejects.

The use of electric heat is almost indispensable when the following conditions prevail :

- (a) When by its more direct and efficient application of heat it is found to be cheaper than other fuels.
- (b) Where it increases production and reduces unit costs.
- (c) When the overall costs are reduced because of the lower labor expense, elimination of rejects, saving of floor space, and convenience in bringing heated products close to other equipment.
- (d) Even where the cost of electric heat is higher it may be justified because of the improvement in product.
- (e) When the possible higher cost may be warranted because of the improved living and working conditions of the operators, safety, convenience, cleanliness, dependability, or accuracy of control.
- (f) When operating costs are of minor importance compared to the results.
- (g) Where other forms of heat cannot be applied.

The efficiency referred to means efficiency of conversion, which is represented by the ratio of the available energy to the heat absorbed. Electrical energy is converted into heat energy without loss, that is, its conversion is one hundred per cent efficiency.

When a kilowatt hour of electricity is consumed, its equivalent in heat units of 3412 b.t.u. is made available. On the other hand, when fuel is burned, only a portion of its heat is made available, and consequently the conversion efficiency is low, the balance being lost largely because of :

- (1) Stack losses.
- (2) Absorption of heat by the air required to support combustion and by the moisture content of both the air and the fuel.
- (3) Incomplete combustion.

Economy

Although the object of this paper is to effect economies by reason of the design of furnace, use of insulation, and selection of the heating elements, it is important to consider also the relative cost of electric heat and fuel heat. Comparative cost estimates based only on the b.t.u. value of fuel and electricity are unfair to the electric method, because they do not take into account the 100 per cent conversion efficiency mentioned above, nor the relatively high application efficiency. To be fair, these estimates must also

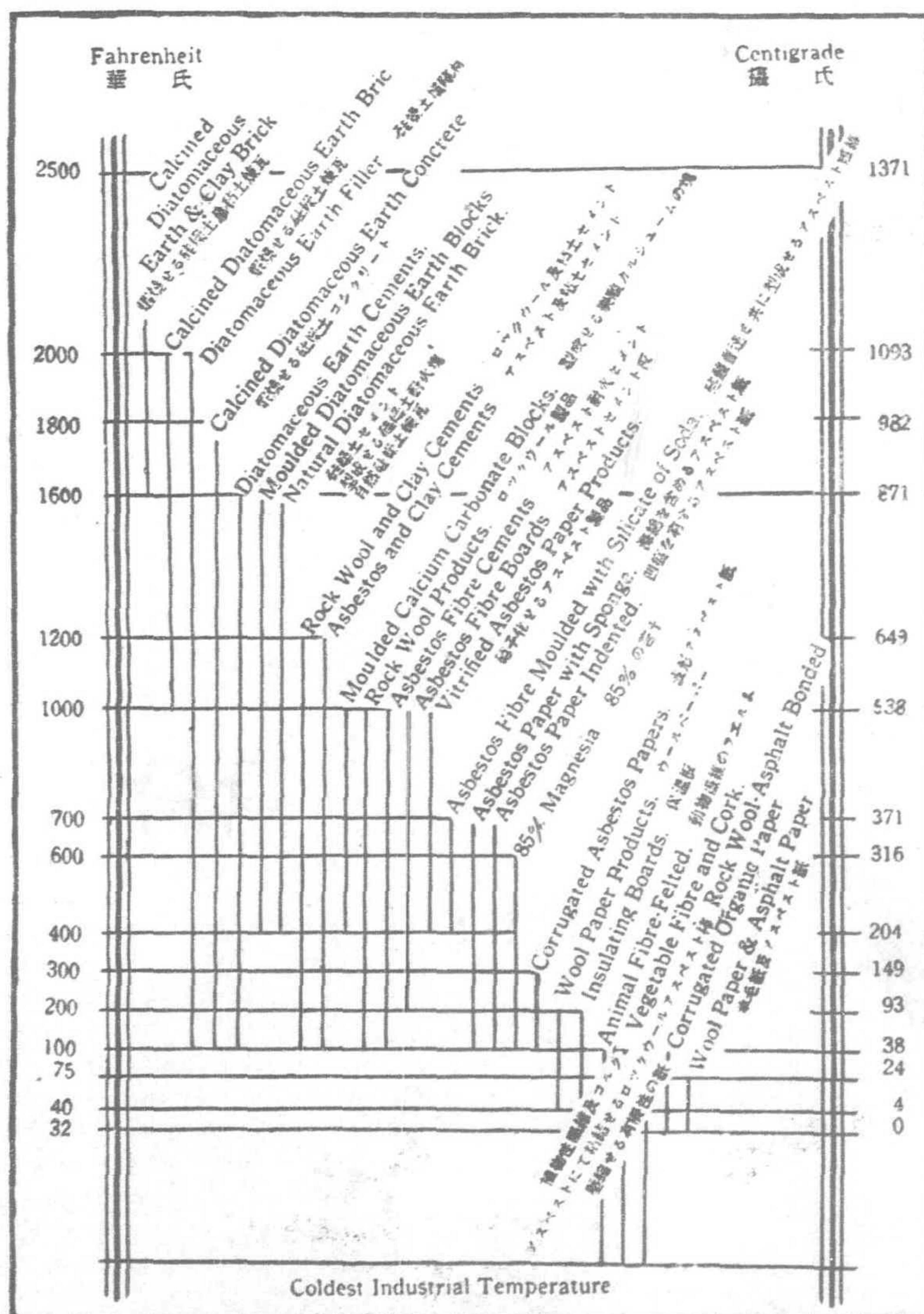


Fig. 1.—Temperature and temperature limit chart of thermal-insulating materials (Townsend and Williams)

*The Japan Nickel Review.

include consideration of the reduced production costs and all of the other items mentioned in the paragraphs on Advantages.

Wilcox* has given a general basis of comparison between fuels and electricity at different prices when the efficiencies are taken into account (but not the relative advantages), by which it is shown that 85 to 95 per cent efficiencies are common with electric heat, while efficiencies as low as 5 to 15 per cent are not unknown with fuel heat in combustion furnaces. Therefore it is apparent that electric heat is often cheaper though no value whatsoever be placed on its superior advantages.

The Economy of Electric Resistor Furnaces

Electric resistor furnaces have a great advantage over combustion furnaces by the elimination of fuel gas losses, emission of air for oxidation and the necessity of carrying off products of combustion to the stack as outlined in the preceding paragraphs.

There remain, however, certain vital elements in the electric resistor furnaces which require close attention if the maximum efficiency from this type of furnace is to be attained. These losses may be classified as follows :

- (1) Loss through openings by radiation
- (2) Unavailable heat in furnace walls part of which is lost by radiation unless the furnace walls are provided with sufficient insulation
- (3) Loss through breakage or deterioration of the electric resistor elements
- (4) Heat loss per unit weight of the material to be heated
- (5) Loss in electric current due to (1), (2), and (4) above.

The object of this paper is to discuss means of minimizing some of these losses by :

- 1.—Suggesting improvements in design whereby openings from which heat radiates may be reduced to a minimum ;
- 2.—submitting a simple formula or means for rapid calculation of the correct thickness of insulation which should be used to minimize heat losses through furnace walls ;
- 3.—by submitting a formula by which the size of resistor elements may be readily calculated, not only for the purpose of furnishing sufficient electric resistance for maintaining necessary temperatures, but also for providing a suitable factor of safety which will give sufficient mechanical strength to the resistor elements at the elevated temperatures through which it is to work, thus prolonging the life of the resistor element and minimizing the cost of replacement

Loss Through Openings

Many cases might be cited where Japanese builders have, by copying foreign-made furnaces constructed for workmen of greater stature than the workers in Japan, found such furnaces unsuitable or service in this country.

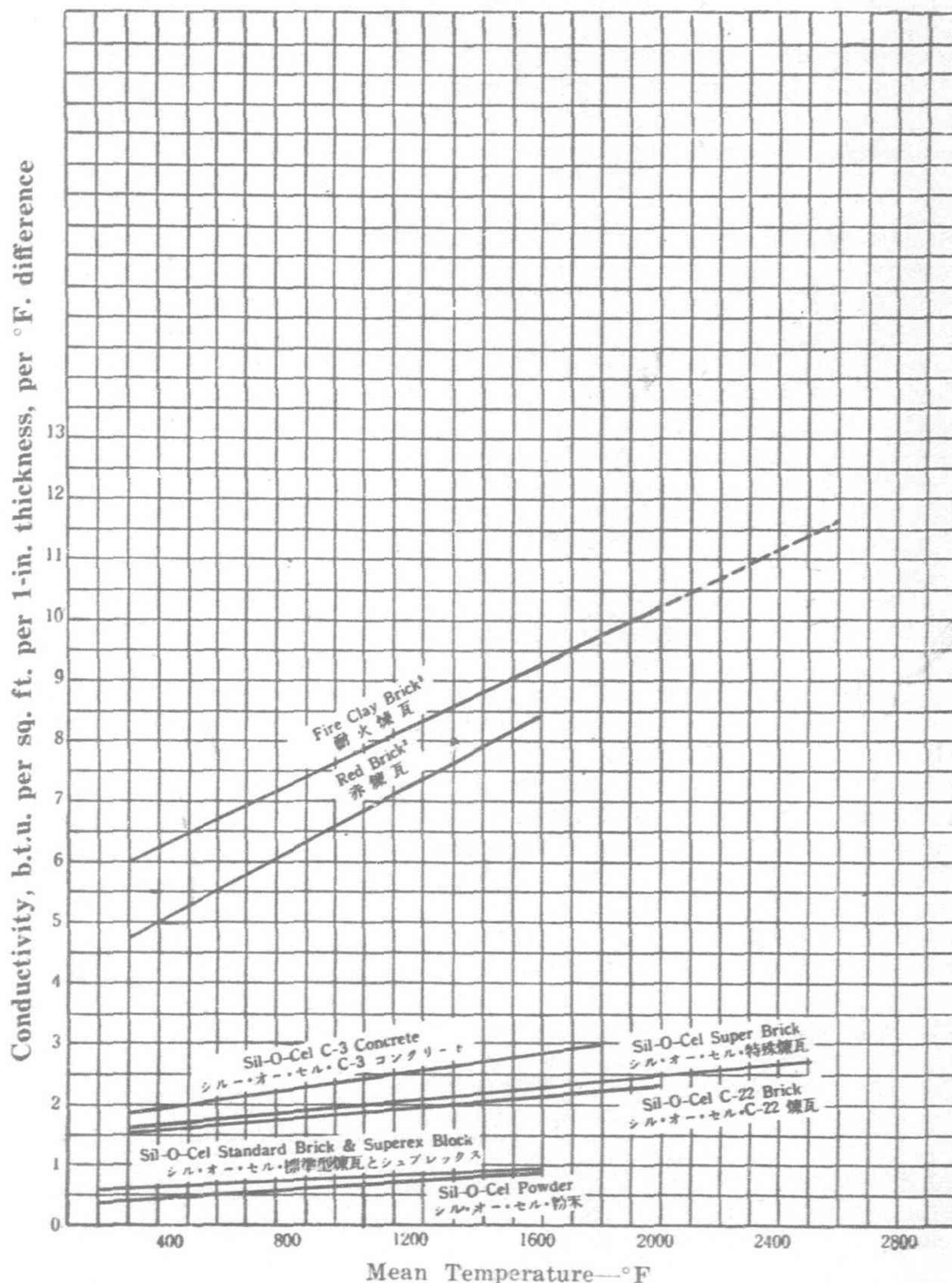


Fig. 2.—Conductivities of fire brick, red brick and high temperature insulating materials
(1) Fire brick average curve (W. trunks, industrial furnaces.)
(2) Average curve of hard-burned and medium hard-burned red brick

A typical example might be taken in the porcelain furnaces made by an electrical firm in Nagoya, which were copied from the American rectangular type. The furnace chamber was so high from the floor and so deep that the operators in the porcelain works could neither load nor unload the furnace. In addition to this point of unsuitability, the makers also failed to provide resistor elements in the doors ; consequently this type of furnace was unsatisfactory from the standpoint of design as well as of construction.

In addition to the aforementioned, the author has seen an otherwise successful cylindrical furnace in use at porcelain shops in Nagoya made unsatisfactory by having large openings in the sides of the furnace, in addition to the circular opening at the top. The side openings were made in order to provide access to the furnace for the operators, and would have been entirely unnecessary had the furnace been sunk in the floor.

These defects are so important that unless they are avoided the economies which are proposed by this paper, that is, correct insulation of the walls and correct calculation of the sizes of resistor elements, will not compensate for losses due to faulty design.

It is impossible to offer any method of furnace design which may be used as a substitute for

the common-sense of an ingenious furnace designer. The following principles, should be followed :

- (a) The furnace should be designed as simply as possible, for receiving and discharging the products which are to be heat treated.
- (b) All unnecessary sizes, angles, and complications should be avoided.
- (c) Access to the furnace should be through the smallest possible aperture, placed in the most convenient position for the operator, and arranged so as to permit a minimum escape of heat during the loading and unloading operations.

Wilcox† gives very valuable advice on this subject,—as follows :

“The design of an electric furnace should not be undertaken by a novice. Most electric furnace failures are directly traceable to poor design or misapplication, the former predominating. Slight errors in design, which might escape notice in fuel furnaces, often prove glaring faults in electric furnaces. In the latter, it is not only necessary to conserve heat, but to apply it to the best advantage. Furthermore, it is essential to plan the furnace for the work rather than the work for the furnace.

“Preliminary Estimates.—Assuming the daily production requirements, the heating cycle and the number of working hours are known, the more important preliminary steps to be taken in planning a suitable electric furnace may be outlined briefly as follows :

- (1) Determine type of furnace best adapted to requirements (i.e., box, car, conveyor, etc.)
- (2) Determine amount of material to be handled per charge.

*Edgar A. Wilcox, Electric Heating, McGraw-Hill Book Co., Inc., New York, 1928. p. 6.

†Edgar A. Wilcox, Electric Heating, McGraw-Hill Book Co., Inc., N.Y., 1928, pp. 209-210.

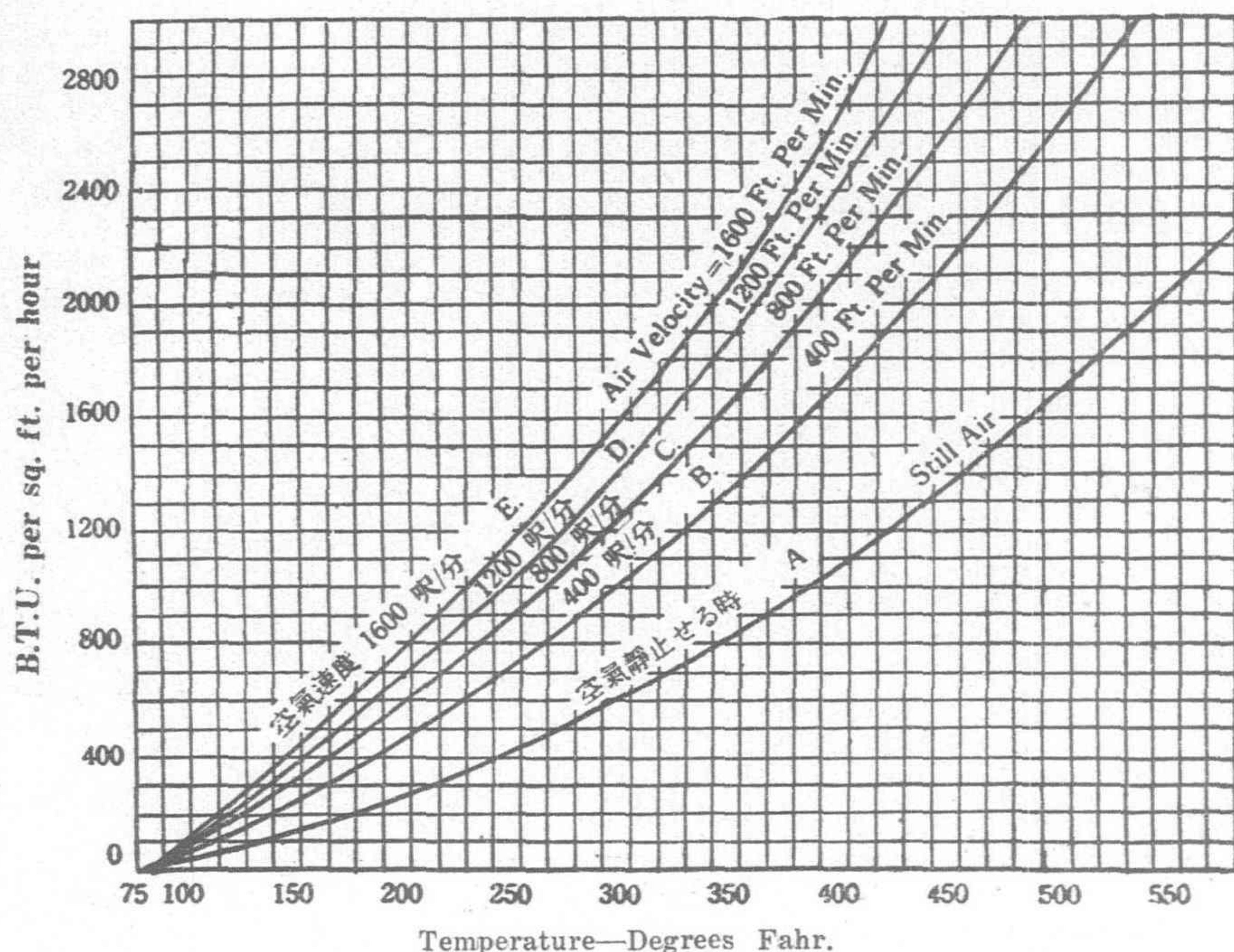


Fig. 3.—Curves based on equations covering heat transfer, by radiation and convection at 80 degrees Fahr., air at various velocities from heated surfaces at various temperatures

- (3) Determine minimum space required for a single charge and the approximate general dimensions of a furnace of sufficient size to handle it.
- (4) Determine kilowatt capacity required for :
 - (a) Absorption by :
 - (1) Refractory linings, hearths, conveyor, etc.
 - (2) Charge
 - (b) Radiation from walls, roof and floor
 - (c) Door and sand-seal losses
 - (d) Factor of safety.
- (5) Determine areas available for resistor mountings :
 - (a)
$$\frac{\text{Kilowatts estimated capacity}}{\text{Square feet of wall space}} = \text{Kilowatts per square foot}$$
 - (b) If kilowatts per square foot are too great (i.e., more than 3 kw.), it may be desirable to mount one-third the capacity below the hearth plates, then :

$$\frac{\text{Two-thirds estimated kilowatts capacity}}{\text{Square feet of wall space}} = \text{Kilowatts per square foot wall area}$$
 - (c) If kilowatts per square foot are still too great, it will be necessary to increase the chamber dimensions and re-calculate steps four and five.
- (6) Calculate size and length of resistor to be used :
 - (a) Based on predetermined watts densities
 - (b) Based on space available for mounting "

Heat Loss Through Walls

Losses through heat storage in walls are essential to heating the furnace charge, but excessive losses due to heat radiation from walls through their outer sections, are unnecessary and should be avoided. In order to avoid such losses, it is necessary to give particular attention both to the refractories and to the insulation used behind the refractories. Thermal insulation conserves heat energy, promotes uniform temperatures by even heat distribution and reduces temperature gradients, the results of these advantages being lower heating and labor costs with increased output and improved product.

The necessity for proper insulation of furnace walls is so

essential to the present-day furnace designer that it is difficult to conceive of furnaces which are built in these times and not provided with such material for preventing heat losses. The author has seen electric resistor furnaces in operation in Nagoya which failed to give satisfactory economic results when compared with combustion furnaces; later by the addition of suitable insulation to the walls the same furnaces indicated a reduction in electrical energy amounting to 30 per cent of the total fuel consumption which factor changed these electric resistor furnaces from an economic failure to a success. Unfortunately, all cases where undue losses result from improper insulation, are not corrected in favor of the electric resistor furnace. A case of this kind came to the author's attention at one of the large glass bottle manufacturing plants near Osaka, where a lehr type annealing furnace was converted from a gas-fired to an electric resistor furnace without any provision for preventing heat losses through the walls. The result was economically unfavorable, although for cleanliness, temperature control and uniformity of heat distribution and product, the electric resistor furnace was superior. However, the heat loss through the lack of insulation was enough of an economic barrier to prevent the use of electric resistor elements in this instance. Proper insulation in this case would have opened a new field for the electric resistor furnace in Japan, as Wilcox reports* a reduction of 20 per cent in cost of annealing bottles in an electric lehr in U.S.A., compared to the cost in fuel-fired lehres.

Thickness of Insulation

The specifications for an ideal heat insulator require that it have a low thermal conductivity at all temperatures as well as the properties of a good refractor.

The maximum thickness of insulation should be used for electric resistor furnaces. Naturally, the higher the cost of generating the heat the greater the economy in keeping the heat within the furnace for productive work.

Insulating materials are of either animal, vegetable or mineral matter. Those produced from animal matter are suitable for low temperatures. Those produced from vegetable matter are suitable for moderate temperatures; and for high temperatures mineral insulating materials are used.

A temperature range and limit chart for thermal insulating materials (Townshend and Williams)† is given in Fig. 1.

The most common insulating materials for high temperatures are those derived from diatomaceous or diathermic earth which were first known in Germany and are sometimes called "Kieselguhr" (Silica Flour). In the United States the trade name of "Sil-O-Cel" has been given to one grade of this material, and another grade is placed on the market as "Diamite."

In powdered form the diatomaceous earth is a most efficient insulator and may be used between the refractors and the outer sheet metal enclosure of the furnace, against refractors at less than 1600°F. There is a permanent shrinkage and change of structure of this material at 1600°F. For use with higher temperatures, bricks are made of this material and calcined or given a combination treatment of calcining and pressing.

* Electric Heating, Edgar A. Wilcox, McGraw-Hill Book Co., Inc., New York, 1928, pp. 237-238.

† Chemical and Metallurgical Engineering, Vol. 39, pp. 219-222, April, 1932.

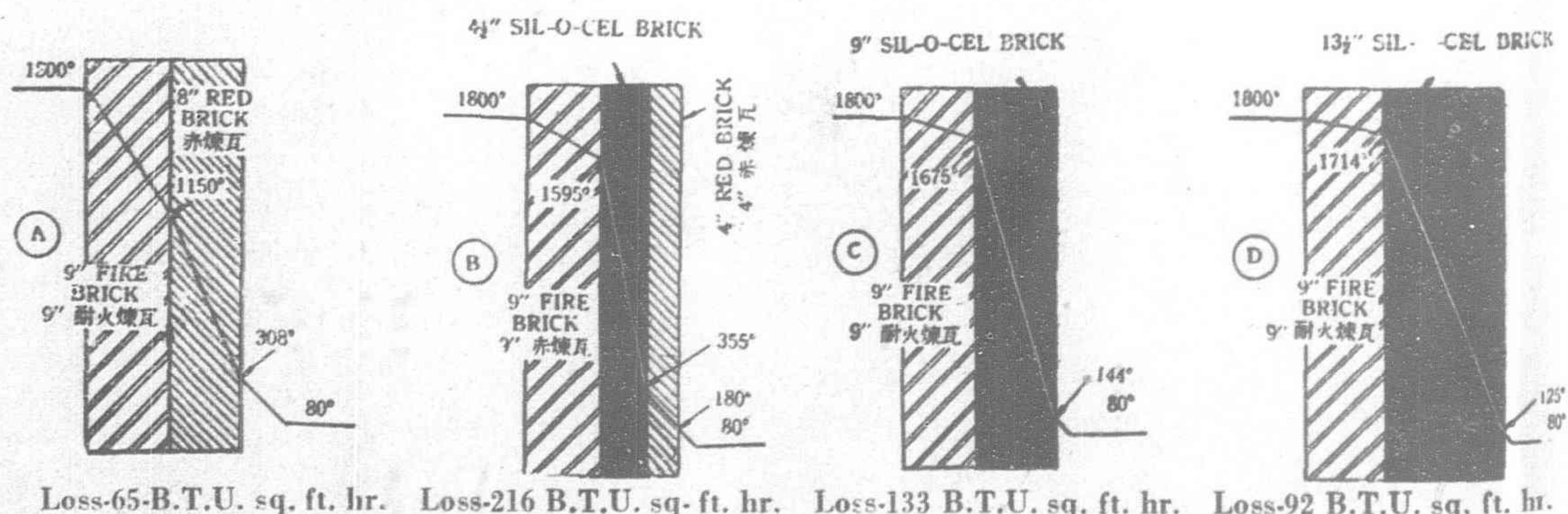


Fig. 4.—Temperature gradients and heat losses through uninsulated and insulated walls

On Figure 2 are plotted the average thermo-conductivities of several kinds of fire brick listed thereon and of Sil-O-Cel insulating brick. The thermo-conductivity of the refractories required for electric resistance furnaces should be as high as possible. Fortunately, there is available in Japan for this purpose in the Cohart brick a refractor with a far higher thermo-conductivity than is shown in Figure 2. The makers claim for Cohart brick double the thermo-conductivity of the silica clay bricks. This high thermo-conductivity is also accompanied by the property of withstanding higher temperatures.

There is also available in Japan an insulating material known as Shinagawa, which is claimed to be superior to Sil-O-Cel in its low heat conductivity, but the tests available show there is a very slight difference in the thermo-conductivity of Shinagawa and Sil-O-Cel. It is therefore reasonable in the absence of complete data on domestic insulating material, to use data which have been compiled for diatomaceous insulating bricks, showing the *b.t.u.* loss through furnace walls of this construction per square foot per hour, as per Table I.

- (c) Rate of circulation of air.
- (d) Nature of the wall.
- (e) Position of the wall (horizontal or vertical).
- (f) Smoothness of the wall material and the construction of the wall, and to some slight degree on the color.

Radiation losses increase rapidly with the rise in temperature, and as a consequence it is increasingly important to reduce heat losses by insulation at the higher temperatures.

It will be noted from curve (A) in Fig. 3 that a furnace wall at a temperature of 200° Fahr. under still air conditions will be dissipating 270 b.t.u. per square foot per hour, while at 400° Fahr. the loss will be 1,110 b.t.u. or more than four times as great. The air velocity on the outside of the wall has considerable effect on the amount of heat which would be lost from the wall at a definite outside temperature. The effect of air velocities is to decrease the thickness and consequently the resistance of the air film on the outside of the wall and consequently the outside temperature will be correspondingly reduced.

TABLE I.—COMPARATIVE B.T.U. LOSS THROUGH FURNACE WALLS WITH AND WITHOUT INSULATION

THICKNESS OF WALLS																									
Total	18"	22"	26"	13½"	17½"	21½"	9"	13"	17"	8½"	12½"	18"	13½"	9"	4½"	18"	22½"	22"	13½"	18"	17½"	9"	13½"	13"	a
Fire Brick	18	18	18	13½	13½	13½	9	9	9	4½	4½					13½	13½	13½	9	9	9	4½	4½	4½	b
Diatomaceous Silica												18"	13½	7	4½	4½	9	4½	4½	9	4½	4½	9	4½	c
Red Brick		4	8		4	8		4	8	4	8										4			4	d
B.T.U. LOSS THROUGH WALL PER SQ. FT. PER HR.																									
TEMP. 4																									
1000 °F	439	353	295	585	442	355	878	590	446	898	595	51	72	110	221	167	86	156	171	100	168	201	102	183	e
1100	483	388	326	644	486	390	965	647	485	986	654	56	78	118	234	182	94	169	185	109	182	214	111	199	f
1200	527	424	354	702	530	426	1050	706	541	1074	714	61	82	127	256	194	103	182	201	117	196	230	119	214	g
1300	570	459	384	760	574	461	1142	768	580	1159	777	65	89	137	275	208	111	195	216	125	210	246	128	229	h
1400	615	494	413	819	618	497	1235	827	621	1260	830	72	92	142	288	222	119	208	230	133	224	263	137	245	i
1500	659	529	443	878	662	532	1321	880	662	1342	875	79	101	153	304	236	127	220	246	141	235	279	145	260	j
1600	702	565	472	936	707	567	1406	947	714	1433	951	83	107	162	330	250	136	233	261	150	243	290	153	276	k
1700	746	600	502	995	751	603	1490	1006	751	1540	1010	88	114	171	341	264	144	245	277	158	268	306	162	291	l
1800	789	635	531	1053	795	638	1576	1065	802	1616	1076	93	120	181	364	279	152	257	292	166	282	323	171	307	m
1900	834	670	561	1112	839	674	1665	1120	841	1704	1134	99	126	189	375	293	160	269	307	174	295	336	178	322	n
2000	877	706	590	1170	883	709	1750	1185	890	1791	1188	104	131	197	390	307	168	281	323	183	309	353	187	337	o
2100	922	741	619	1229	927	745	1849	1246	929	1885	1246	110	136	206	410	321	176	295	347	192	322	370	196	353	p
2200	965	776	649	1288	971	780	1934	1295	980	1971	1310	114	141	214	421	335	184	308	363	200	336	385	205	368	q
2300	1009	812	679	1346	1016	816	2016	1356	1025	2050	1365	119	146	223	440	349	192	321	378	208	351	401	213	384	r
2400	1053	847	708	1404	1060	851	2111	1420	1071	2152	1426	124	151	241	481	363	201	334	394	215	365	418	222	399	s
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	

This table is based on conductivity of fire brick = 7.9
red brick = 7.2
diatomaceous silica = 1.0
(infusorial earth)

These materials are composed of diatomaceous silica, and are insulators due to the fact that they contain by volume as much as 85 per cent minute air cells which give a low heat conductivity. It has been estimated that there are about fifty million individual cells in each cubic inch of the natural mineral when composed of pure silica (SiO₂). The material has a comparatively high melting point (2930° F.).

In the loss of heat from a furnace wall there is involved :

- (a) Transmission of heat by conduction through the wall to the outer surface.
- (b) Dissipation of heat from the outer surface of the furnace to the air by radiation.

The quantity of heat transmitted by conduction through the wall varies directly with :

- (a) The area of the wall.
- (b) The temperature difference between the hot and cold surface of the wall.
- (c) The thermal conductivity of the materials of which the wall is composed.
- (d) And varies inversely with the thickness of the wall.

The rate of emission of heat from the cooler face of the wall depends on various factors :

- (a) Mainly upon the surface temperature.
- (b) Temperature difference between the wall and the adjacent air.

The curve for still air is based on Stefan and Boltzman's law, while the curves for moving air are from equations by Langmuir.*

As the heat flow by conduction through the wall increases in approximately direct proportion to the temperature difference between inner and outer surfaces, a wall exposed to moving air will be at a lower temperature than if the air were still, and will be actually losing a greater amount of heat.

The difference between the furnace temperature and that of the inside surface of the furnace wall depends upon a number of variables :

- (a) Temperature of the furnace.
- (b) Pressure conditions within the furnace.
- (c) Thickness and composition of the furnace walls.

Usually the temperature of the inside surface of the walls is not sufficiently lower than that of the furnace itself to materially affect the calculations. Therefore there is less likelihood of error by disregarding this factor entirely than if an attempt were made to calculate it exactly. Thus, in the formula which follows the inside wall surface, temperature is taken as the same as that of the furnace, and is practically correct in the higher temperature ranges, the readings for which are usually secured by means of optical or radiation pyrometers set on the furnace walls, or by placing a thermo-couple in the wall with the points close to the surface. In

* Transaction of American Electro-Chemical Society vol. 23.

such cases the temperature observed is actually that of the wall surface rather than that of the furnace.

With the elimination of this factor a method for determining the rate of conduction through the walls is given as follows:

Method of Determining Rate of Conduction Through Walls*

The empirical formula for heat flow through walls composed of two or more materials of varying conductivities follows (based on b.t.u. per sq. ft. per hour—temperature in degrees Fahr.):

$$Q = \frac{t_1 - t_2}{\frac{x_1}{k_1} + \frac{x_2}{k_2} \text{ etc.}}$$

Where Q =quantity of heat conducted in b.t.u. per sq. ft. per hour.

t_1 =temperature of the hotter surface (deg. F.)

t_2 =temperature of the cooler surface (deg. F.).

x_1, x_2 =thickness in inches of each course of material.

k_1, k_2 =conductivity of each material in b.t.u. per sq. ft., per hour, per inch thickness, per degree F. difference in temperature.

Surface Resistance

It will be noted that t_1 and t_2 are the inside and outside surface temperatures of the wall. Due to the resistance of the surface films of air on either side of the wall, the temperature of the hotter surface will be somewhat lower than that of the gases within the furnace and the temperature of the cooler surface will be hotter than that of the air on the outside of the wall.

The heat loss from the outside of the walls is one of the salient factors affecting the economy of furnaces. If furnace walls are made of a single refractory material, the temperature gradient will indicate a steady flow of heat through the furnace wall and equal pressure on both sides of the wall. In other words, the temperature of the wall drops steadily towards its outer surface, at which place the temperature will be higher than that of the surrounding air. The heat loss from a given extent of wall and for a given furnace temperature is reduced if the wall is made thicker, or if the wall is insulated. Examples of temperature gradients and heat losses through uninsulated and insulated walls are given in Fig. 4.

Trinks expresses this temperature gradient by the equation.†

$$H = \frac{C(T_i - T_o)}{S} = K(T_o - T_a)$$

where H =the heat transmitted in b.t.u. per square foot per hour,

T_o =temperature of outer surface of wall

T_i =temperature of inner surface of wall

T_a =temperature of outside air

C =conductivity of brick, b.t.u. per square foot, per hour, °F., inch thickness;

K =coefficient of heat dissipation from outer surface of wall, b.t.u. per square foot, hour, °F.;

S =thickness of walls.

The unknown quantities of this double equation are H and T_o . They can be found if all other quantities are known. Unfortunately, for simplicity of calculation, neither K nor C is constant. They vary according to circumstances. The coefficient K varies with (a) the temperature of the outside wall, (b) the position, whether horizontal or vertical, (c) the physical condition, and (d) size.

There are many variables which affect this coefficient, but for all practical purposes these are taken as constant in the formula given.

The coefficients of conductivity of refractories are likewise variable with the temperature, although not nearly as variable as the coefficient of heat dissipation.

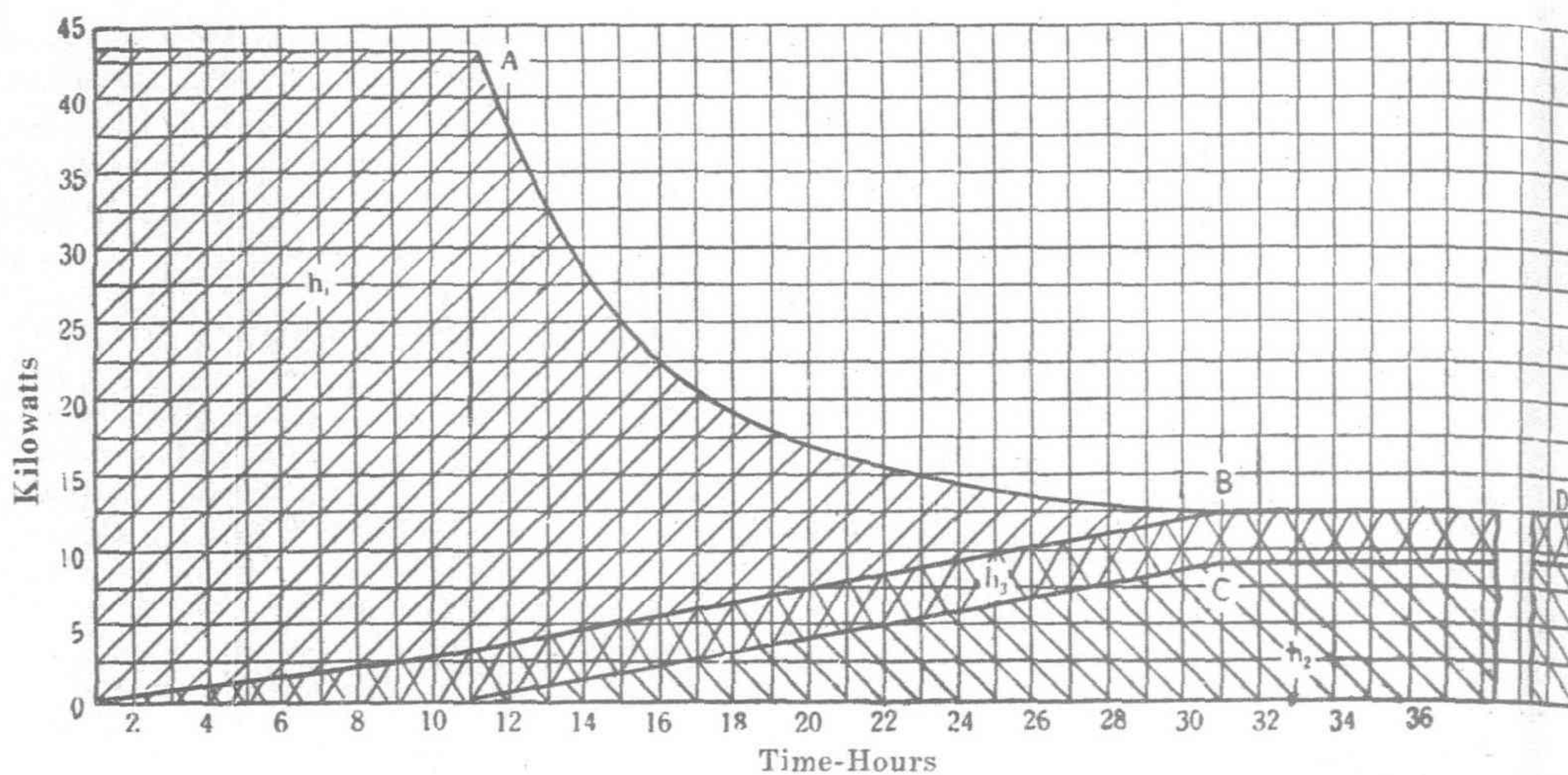


Fig. 5.—Heat balance diagram of heating chamber h_1 Heat stored in structure. h_2 Heat transfer through the enclosure. h_3 Heat loss through openings

For practical purposes it is desirable to have charts giving the heat loss under average condition per square foot of wall and per hour for various wall temperatures. This average conductivity for refractory materials is given in Fig. 2.

Problem: Find the heat loss in b.t.u. per sq. ft. per hour through a wall composed of 9-in. of fire brick, 4½-in. Sil-O-Cel standard brick, and 8-in. of red brick, with an inside temperature of 1800 °F., using formula given.

In figuring the heat loss through a wall, the first step necessary is to estimate the approximate temperature gradient through the wall, so that the conductivities (k) of the materials may be estimated. A convenient method of determining approximate temperature gradient is to convert all materials in the wall to the basis of approximate equivalent thickness of fire brick. The average conductivity of fire brick is about 9 b.t.u. Therefore an insulating material with a conductivity of 0.9, would be equivalent to 10-in. of fire brick per inch of insulation. The following rough averages may be used for this purpose, for the different materials shown in Fig. 2.

Material	Equivalent Fire Brick Thickness per inch	
Sil-O-Cel Powder ..	16.0	Factors based on average temperatures encountered in actual operation for each material. The average temperature to which the materials are subjected in service is lower for insulating material than for refractories.
Sil-O-Cel Standard Brick † ..	13.0	
Superex Block ..	13.0	
Sil-O-Cel C-22 Brick ..	5.5	
Sil-O-Cel Super Brick ..	5.5	
Sil-O-Cel C-3 Concrete ..	4.5	
Red Brick ..	1.5	

A wall, therefore, with 9-in. of fire brick, 4½-in. of Sil-O-Cel standard brick, and 8-in. of red brick would have a resistance of $9 + 58.5 + 12$, or $79\frac{1}{2}$ units of equivalent fire brick thickness. In other words, the proportional part of the total temperature drop through each material in the wall is represented by the following fractions:

9	58.5	
—through the fire brick,	—through the insulation,	and
79.5	79.5	
12		
—through the red brick.		
79.5		

For this preliminary step of the calculation (estimating approximate temperature gradient) outside surface temperature may be assumed to be 200° F., as this is close enough to the average for conditions ordinarily encountered.

If we have an inside surface temperature of 1800° F., therefore the total drop will be 1600° (1800°–200°) and the approximate temperature gradient is as follows:

* Courtesy of Johns-Manville Corporation.

† Trinks, Industrial Furnaces—Vol. 1 (Second Ed.) John Wiley—1926, p. 61.

‡ The Shinagawa Fire Brick Mfg. Co., claims that by tests made in August, 1926, their standard insulating brick was proved to be of lower heat conductivity than the sil-o-cel standard brick.

Temperature drop through	Temp. Hot Face Material	Temp. Cold Face Material	Mean Temp. each Material
Fire-Brick— 9			
$1600 \times \frac{9}{79.5} = 181^\circ$	1800°	1619°	1710°
Sil-O-Cel Brick— 58.5			
$1600 \times \frac{58.5}{79.5} = 1177^\circ$	1619°	442°	1030°
Red Brick— 12			
$1600 \times \frac{12}{79.5} = 242^\circ$	442°	200°	321°

The conductivities of the materials at their respective mean temperatures are then obtained from Fig. 2, and a trial calculation made as follows: (See formula)

$$Q = \frac{1800 - 200}{\frac{9}{9.6} + \frac{4.5}{0.80} + \frac{8}{5.00}} = 196 \text{ b.t.u. per sq. ft. per hour}$$

This preliminary calculation is made only for the purpose of forecasting the approximate outside temperature and temperature gradient through the wall. From the above, these figures can be obtained very closely.

The approximate outside temperature is obtained by reference to Fig. 3. For a b.t.u. loss of 196 the outside temperature is found to be 171° (with surrounding air temperature of 80°F. *, which gives a total temperature drop of 1629°.

The temperature drop through each material will be in proportion to the proportional resistance of each material. In this case the total resistance between surfaces was 8.162, made up as follows:

Fire Brick	$\frac{9}{9.6} = 0.937$
Sil-O-Cel	$\frac{4.5}{0.80} = 5.625$
Red Brick	$\frac{8}{5.00} = 1.600$
Total Resistance	8.162

The temperature drop through each material is, therefore:

Temperature drop through	Temp. Hot Face	Temp. Cold Face	Mean Temp.
Fire Brick 0.937			
$\frac{0.937}{8.162} \times 1629 = 187^\circ$	1800°	1613°	1706°
Sil-O-Cel 5.625			
$\frac{5.625}{8.162} \times 1629 = 1123^\circ$	1613°	490°	1051°
Red Brick 1.600			
$\frac{1.600}{8.162} \times 1629 = 319^\circ$	490°	171°	330°

We are now ready to make our first definite calculation for heat loss, using 171° as outside temperature t_2 , and using conductivities for the materials at their above mean temperatures from Fig. 2. (In this particular case it was not necessary to change the conductivity of the materials as used in the trial calculation).

$$Q = \frac{1800 - 171}{\frac{9}{9.6} + \frac{4.5}{0.8} + \frac{8}{5.00}} = 200 \text{ b.t.u. per sq. ft. per hour.}$$

Curve A in Fig. 3 is then again referred to and a point plotted for the outside temperature used and the b.t.u. loss secured; in this case 171°F. and 200 b.t.u. If the point falls on the curve no other calculation is required. This will not generally be true, however. In this particular case it will be found that the trial calculation gives a point slightly above the line, indicating that the temperature of 171°F. was low. Another calculation should then be made using an exterior temperature which will give a point on the opposite side of the curve to that of the first point. In this instance a temperature 9° higher will be sufficient, or 180°F.

$$Q = \frac{1800 - 180}{\frac{9}{9.6} + \frac{4.5}{0.8} + \frac{8}{5.00}} = 199 \text{ b.t.u. per sq. ft. per hour}$$

A point for this temperature and b.t.u. loss (180°F. and 199 b.t.u.) is then plotted on Fig. 3 and a line drawn from this point to the point corresponding to 171°F. and 200 b.t.u. secured in the preceding calculation. The point where this line intersects the curve gives the true b.t.u. loss and outside temperature; in this case 199.5 b.t.u. for heat loss and 175°F. for outside surface temperature.

In cases where the first trial does not come so close to the actual b.t.u. loss for the temperature chosen, a correspondingly greater difference in outside temperature should be used for the second calculation so that the second point secured will be on the opposite side of the curve. If, due to a miscalculation, both points should fall on the same side of the curve, the line can be extended to intersect the curve, provided the point closest to the curve is not more than about 20° away.

Calculation for Temperature Gradient

The temperature gradient through the wall can now be calculated, using the method previously described. The total resistance is 8.162, made up as follows:

Fire Brick	$\frac{9}{9.6} = 0.937$
Sil-O-Cel	$\frac{4.5}{0.8} = 5.625$
Red Brick	$\frac{8}{5.00} = 1.600$
Total Resistance	8.162

The temperature gradient, therefore is:

Temperature drop through	Temp. Hot Face	Temp. Cold Face	Mean Temp.
Fire Brick 0.937			
$\frac{0.937}{8.162} \times 1625 = 187^\circ$	1800°	1613°	1707°
Sil-O-Cel 5.625			
$\frac{5.625}{8.162} \times 1625 = 1120^\circ$	1613°	493°	1053°
Red Brick 1.600			
$\frac{1.600}{8.162} \times 1625 = 318^\circ$	493°	175°	334°

Temperature gradients and heat losses through an uninsulated wall (A) and three types of insulated walls (B), (C) and (D) are shown graphically in Fig. 4.

The amount of heat transferred in electrical units can be ascertained by the following formulas:

$$\text{Watt-hours} = \frac{Q}{3.412}$$

$$\text{Kilowatt-hours} = \frac{Q}{3412}$$

Where Q = b.t.u. transmitted
 3.412 = b.t.u. in a watt-hour
 3412 = b.t.u. in a kilowatt-hour

Heat Conductivity of Materials

The thermal or heat conductivity K of the different substances varies with the nature of the substances and becomes an important factor in furnace design, but as the scope of this paper includes only the economics of insulation and the selection of heat resistance elements, reference to the conductivities of materials to be heated is confined to a summary of the opinions of three leading authorities.

The prevailing method for heating the chamber is to allow 1½ to 3 kw. per sq. ft. of area of wall covered by heating elements.

(To be continued next month)

* Note: Where air temperatures are other than 80°F., the outside surface temperature will be correspondingly higher or lower than that indicated by the curve.

Two New Russian Transport Systems*

INVENTORS in different countries have long been working on the problem of a faster means of transportation than is possible on the existing railways. Many projects were advanced at the end of the nineteenth and the beginning of the twentieth centuries. Recently, there has been the carriage-zeppelin on rails in Krukenberg, the carriage-aeroplane on rails in Germany, the air-train of the Soviet inventor, Mr. Waldner, and the ball-bearing train of another Soviet engineer, Mr. Yarmolchuk.

The reason for these projects is not far to seek. Despite modern technical development, the train of to-day still runs on two rails and wheels with flanges, on which it is impossible to attain great speed, to move goods and passengers from one place to another quickly enough to satisfy modern requirements.

The lack of a super-fast means of transporting large volumes is particularly felt in the Soviet Union with its tremendous distances and growing national economy. But as that economy is not hampered by the need to consider vested interests in existing transport systems full scope and encouragement is given to inventors who are working on faster modes of transport.

The two most notable inventions in the Soviet Union in this respect are the air-train of Mr. Waldner and the ball-bearing train of Mr. Yarmolchuk.

The Air-Train

Mr. Waldner's air-train runs on an elevated single-rail track. The experimental train is designed in the form of two zeppelin-like carriages linked together by a rigid steel frame, and hanging over both sides of the single-rail track. It is capable of developing a speed of 300 kilometers an hour. The air-train is propelled by aeroplane propellers. It has two Diesel engines of a combined capacity of 1,060 h.p. Each of the carriages has a seating capacity for 40 passengers. The standard air-train is to have seating capacity for 300 passengers and is to be driven either by a Diesel engine or by electric motors.

Mr. Waldner's air-train runs on a single row of wheels situated between the carriages. Equilibrium is maintained by means of runners fitting between the inner side of each carriage and the concrete frame-work supporting the rail.

The average cost of building this type of railway, including rolling-stock, is estimated to be 300,000 roubles per kilometer. The cost of carrying a passenger is estimated at 0.5 to 0.75 kopeks per kilometer, against the present cost on the railways of 1.5 to 2.5 kopeks per kilometer.

A model air-train and track has been built in the Central Park of Culture and Rest in Moscow and the Commissariat for Transport is building an experimental track of 20 kilometers long to test out the practical value of this new invention.

The Ball-Bearing Train

The ball-bearing train of Mr. Yarmolchuk is based on the principle

of mono-linear motion of the bicycle or motor-bicycle and speed forms a factor in its equilibrium. The carriages are streamlined in form and run on motorized ball-bearings in a grooved track, which in the model is made of wood, but can be made of concrete or ferro-concrete. Each carriage rides on two large balls. On the axle of each ball is suspended a powerful but compact motor. The motors remain stationary but operate on the axle, thus revolving the balls and propelling the train with a minimum of lost power. The balls are almost as high as the carriages in which they are placed, thus giving the train a very low center of gravity. The balls run in a grooved runway. As each unit of the train has its own means of propulsion, as far as weight is concerned there is no limit to the number of carriages that may be attached to a train.

The carriages are absolutely steady when moving in the groove and maintain a stable equilibrium both when travelling in a straight line or taking curves of a minimum curvature of 75 m. This has been established by numerous tests.

The inventor claims that the ball-train can attain a speed of 250 to 300 kilometers an hour. In the experimental run of the model (small size) ball-train, which was successfully carried out last month, a speed of 60 to 70 kilometers an hour was maintained with perfect steadiness of motion.

The grooved runway looks like a long water-trough or a giant skittle alley. Above it are the electricity conductors.

The ball-bearing train will be very economical to run. With the same amount of current consumed by the ordinary electric train, a speed of 250 to 300 kilometers an hour can be attained by the ball-bearing train.

The electrical equipment (contactors, controllers) is the same as that used in ordinary electric propulsion.

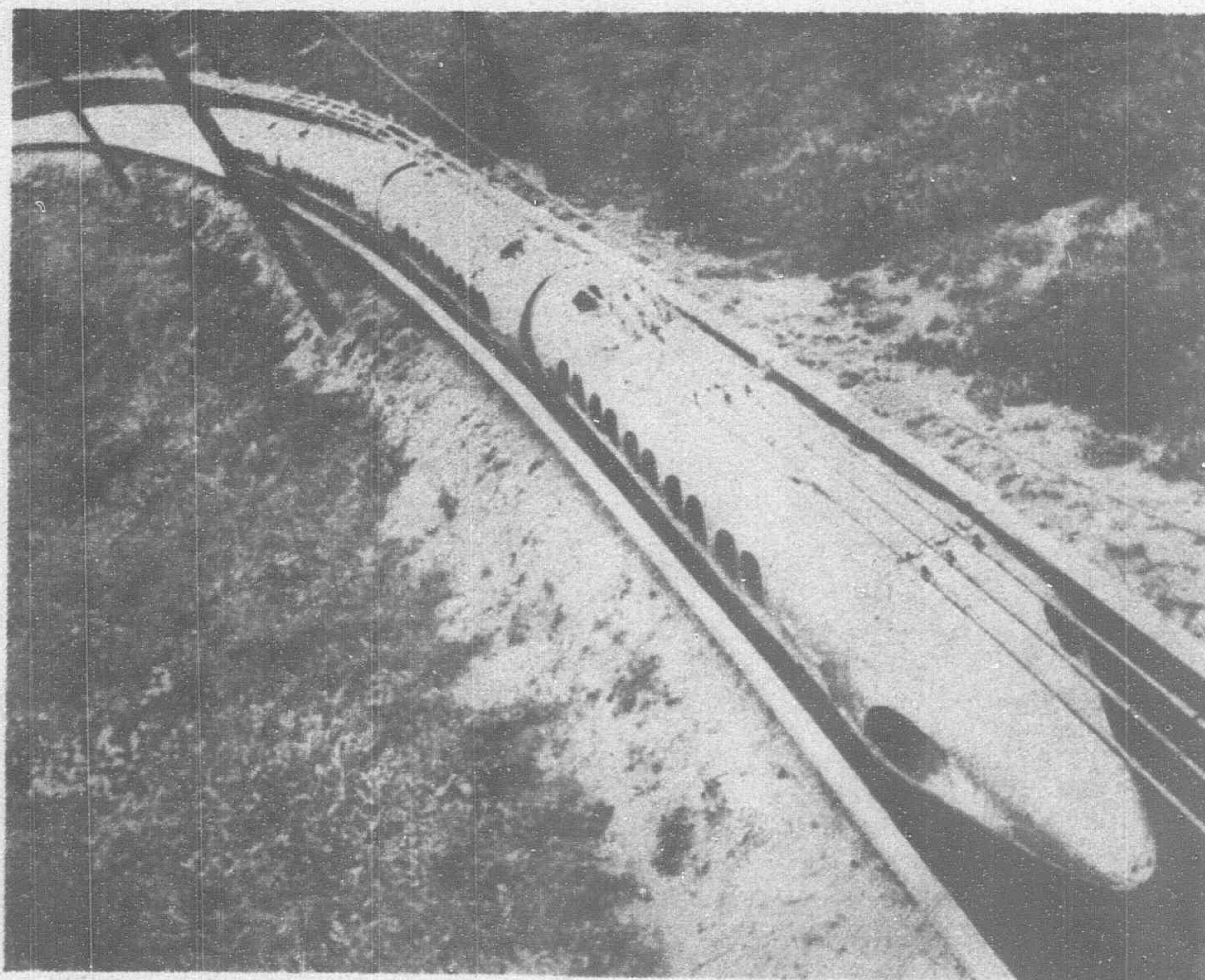
The train is controlled by a system of separate units, and can be controlled from any of the carriages. Where an external supply of electricity is unavailable, power will be provided from carriage electric stations.

Mr. Yarmolchuk and his colleagues of the Bureau for the experimental building of a super-fast transport system consider that the laying of the ways for the ball-train will require much less

capital than other systems, and that a ball-train is capable of handling twice as much passenger and goods traffic as a steam train and two and a half times as much as an electric train.

The model, successfully used in the run referred to above was 0.75 meters in diameter and 6.25 m. in length. The experimental runway was 3,000 m. long.

The Soviet Government has allocated the necessary money to build a ball-bearing train way for commercial exploitation. The building of this line will be commenced next year. It promises to create a revolution in the transport system of the country.



The New Ball-Bearing Train

*British-Russian Gazette and Trade Outlook

New Mendiola Bridge is Needed in Manila*

Proposed Structure Would Relieve Downtown Traffic Forty Per Cent

By FRANK LEWIS MINTON

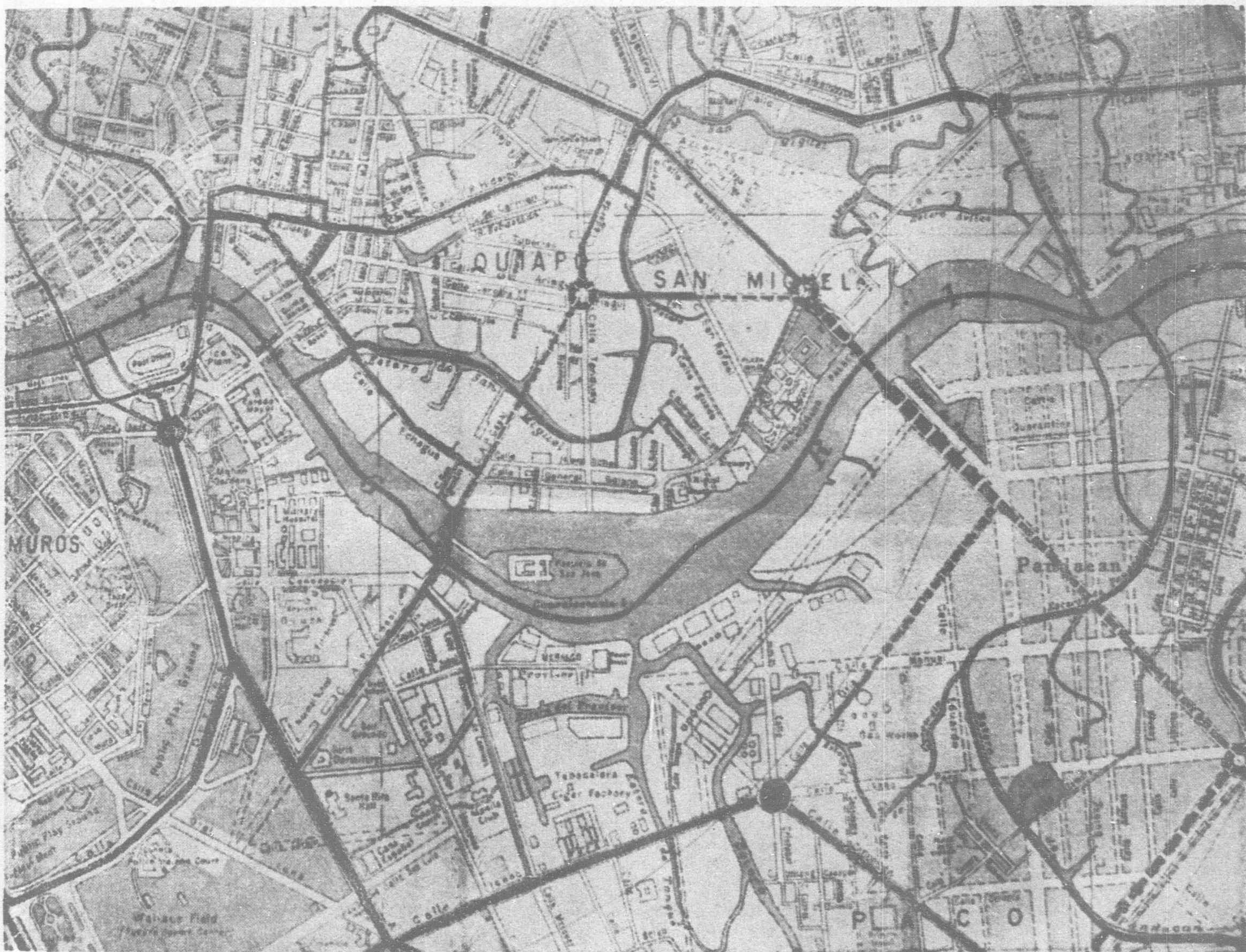
IT is axiomatic that the best way to relieve traffic congestion on a bridge is to build another bridge. Nowhere is the truth of this statement brought home more forcibly than in Manila, where one recalcitrant carromata pony, or one unhurried carabao, may hold up a line of traffic, however long, on any bridge or at any street intersection. On February 16, 1931, the Bureau of Public Works announced the early construction of a steel bridge across the Pasig river at Mendiola street. According to the *Manila Daily Bulletin*, February 17, 1931, Mayor Tomás Earnshaw advised J. C. Cookingham, then acting Director of Public Works, that the necessary funds would be made available from the P.2,000,000 bond issue, which was a part of the P.10,000,000 bonded indebtedness authorized for the city of Manila.

The proposed structure was to be a steel bridge, 420 feet long, exclusive of approaches, composed of three spans each 140 feet in length. There would have been two roadways, each 20 feet clear, giving the bridge a capacity of four lanes of traffic, with a six foot sidewalk at either side. The estimated cost of the bridge was P.700,000, exclusive of approaches and street development.

It was pointed out by officials, and others, that—conservatively speaking—60 per cent of the heavy freight traffic, or 35 per cent of all business traffic, would be diverted from the Jones, Sta. Cruz and Ayala bridges to calle Azcarraga via the Mendiola street bridge when the project was completed; that the distance to downtown points and roadheads leading to Pampanga, Tarlac, Pangasinan and the Ilocos country would be considerably decreased, thus benefiting the industrial plants at Pandacan, and their many customers and consumers who, having their own trucks or other means of transportation, take delivery of goods, bring copra or other produce to sell, and transact other business in the Pandacan district.

Again the point was stressed that the best way to relieve traffic congestion is to build another bridge, and to build it at a point where heavy traffic would certainly and permanently be diverted from the other bridges, and also from certain residential and downtown streets. It was shown that the completion of the Mendiola project and the considerable widening of callejon

*The American Chamber of Commerce Journal.



The plan shows how Mendiola bridge would route heavy traffic from the Pandacan Industrial District around the Downtown District and along calle Azcarraga

Jesus would greatly reduce traffic on the narrow and dangerous calle Zamora.

To the considerable disappointment of Pandacan residents, and to concerns having warehouses or plants in the Pandacan district, and to their many customers and consumers, the Mendiola street plans seem to have been indefinitely shelved. These people point out the need of short and adequate routes for heavy freight traffic, the expense to them and their customers occasioned by being forced to traverse long and circuitous and overcrowded streets, the neglected and even dangerous condition of streets in Pandacan and vicinity, contrasted with their commercial and industrial importance, and heavy tax burdens.

All correspondence concerning the Mendiola street project in the Bureau of Public Works was destroyed in the recent Intramuros fire, but according to such information as has yet been made available, for publication, the plan was dropped in the interests of economy. A few days after the Mendiola plans were made public another huge project was announced—the great vehicle, tramway and railway bridge over the lower Pasig—connecting Bonifacio drive with calle del Pan. This project was obviously too ambitious at the time. It would have cost over P.3,000,000 exclusive of street development and the cost of land for the approaches; and it would have forced the Manila railroad to invest considerable sums in rail extensions at an inopportune time. The relative merits of the lower Pasig and the Mendiola projects were discussed, somewhat desultorily, for a few weeks. Then the subject was dropped.

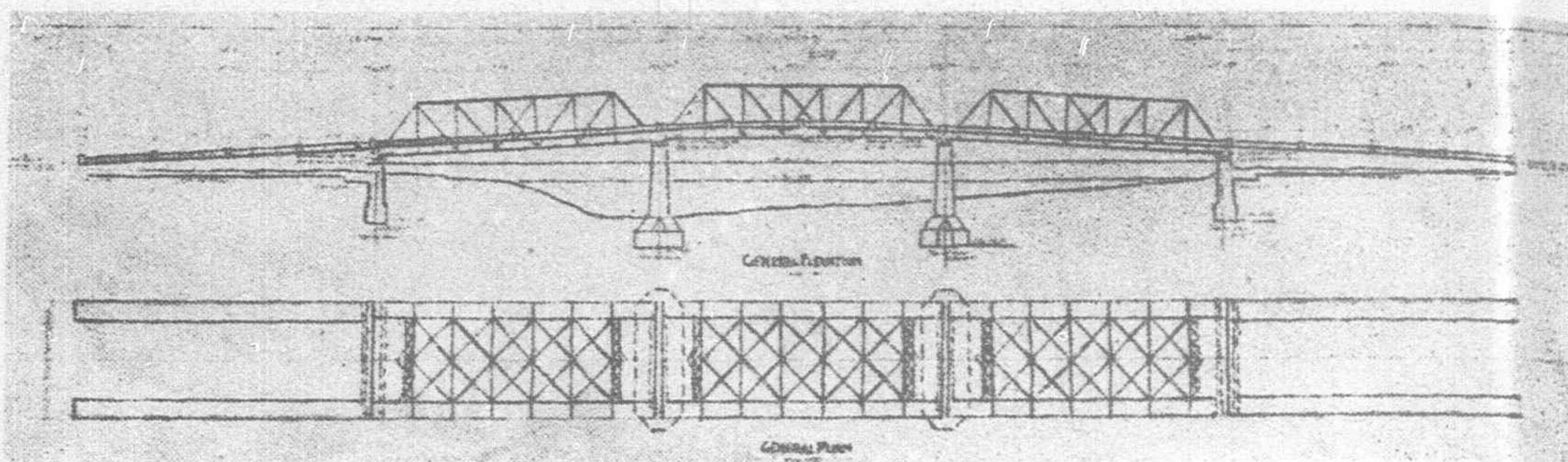
The newest project for the relief of traffic congestion is the *Ayala Bridge Addition*. It is proposed to build another bridge contiguous to the present Ayala structure, with a capacity of three lanes of traffic and 12 foot sidewalk. It is understood that the supports of the proposed structure would be of sufficient size and strength to permit of doubling the width of the new bridge when, and if, necessary. Two estimates have been prepared: one for a steel bridge to cost P.450,000, and one for a concrete structure to cost P.600,000. It is obvious that neither estimate includes the cost of land for approaches, nor the development of calle Pascual Casal.

In order to demonstrate the need of new arteries of traffic, leading directly to Provincial roadheads and downtown districts, rather than the development of circuitous and already overcrowded routes traversing congested districts, the writer has obtained figures which give some idea of the immense and rapidly increasing tonnage of Pandacan freight traffic, the diversion of which would relieve congestion and make for greater safety of passenger traffic on residential streets, and in the crowded downtown districts.

It is, of course, impossible to state exactly the tonnage of street traffic between Pandacan and Manila, but by consistent understatement of figures, secured from the various reliable sources, it is at least possible to arrive at the absolute minimum estimate of such traffic; so the reader may be sure that the following estimate is less than the actual tonnage. First let us glance at the tables, taken from the reports of the Insular Collector of Customs, covering a period of ten years:

MINERAL OIL IMPORTS

Crude Oils, Liters			Kerosene, Liters		
1923	..	219,031,937	1923	..	56,795,391
1924	..	268,134,548	1924	..	65,173,701
1925	..	239,488,410	1925	..	60,028,279
1926	..	183,405,035	1926	..	67,290,999
1927	..	161,714,042	1927	..	69,006,504
1928	..	150,763,613	1928	..	69,381,365
1929	..	277,773,185	1929	..	84,621,511
1930	..	230,126,086	1930	..	68,826,433
1931	..	296,363,969	1931	..	94,656,344
1932	..	290,170,751	1932	..	57,488,761
Total	..	2,316,971,676	Total	..	693,269,288



The proposed Mendiola street bridge in Manila

Motor Spirits, Liters			Lubricating Oils, Liters		
1923	..	19,633,663	1923	..	7,194,278
1924	..	38,878,404	1924	..	10,300,961
1925	..	48,315,968	1925	..	9,057,243
1926	..	55,221,007	1926	..	11,625,431
1927	..	53,860,209	1927	..	9,140,137
1928	..	86,863,351	1928	..	15,051,711
1929	..	97,308,532	1929	..	11,533,876
1930	..	93,382,805	1930	..	14,497,075
1931	..	145,250,834	1931	..	12,544,842
1932	..	120,611,582	1932	..	17,066,949
Total	..	759,321,355	Total	..	118,012,503
Asphaltum, Kilos			Residuum: Tar, etc., Kilos		
1923	..	1,867,608	1923	..	367,840
1924	..	2,421,332	1924	..	1,549,461
1925	..	1,770,149	1925	..	1,783,843
1926	..	2,155,005	1926	..	927,082
1927	..	1,289,966	1927	..	853,173
1928	..	3,525,445	1928	..	1,136,667
1929	..	4,095,278	1929	..	1,174,585
1930	..	7,397,114	1930	..	925,591
1931	..	7,003,425	1931	..	2,204,385
1932	..	8,211,087	1932	..	525,690
Total	..	39,777,409	Total	..	11,238,317
Total liters	..	3,887,574,882	A liter of gasoline weighs slightly less than a kilo. For this reason the imports of Naphthas, other than Motor Spirits, which amount to about 100,000 liters annually, has been left out of the above tables, and the rough total is taken as four billion kilos of petroleum products during the 10 years from 1923 to 1932 inclusive.		
Total kilos	..	51,015,548			
Kilos and liters.. 3,938,590,548			Analyzing the foregoing figures we find that, allowing for the lighter distillates of gasoline, not listed herein, over four billion kilos of petroleum and its by-products have been delivered in the Philippines during the past decade. Approximately two billion kilos of this amount has been received in Manila. Of the Manila consignments, a half, or a billion kilos have been delivered by truck or lighter carriers, the other half by rail and river.		

Considerably over 90 per cent of the Islands' business in petroleum products is handled by the six great companies having their storage tanks in Pandacan. This means that over 900,000 tons of petroleum products, alone, have passed through tiny callejon Jesus, and along the narrow and dangerous calle Zamora during the past ten years—an average of 90,000 tons per year. It is estimated that Spencer Kellogg & Sons, and other plants operating in Pandacan add between 20 per cent and 30 per cent to the huge volume of traffic passing over these narrow streets. Thus, adding 18,000 tons to the 90,000 tons of petroleum products, we find that at least 108,000 tons of miscellaneous freight pass through callejon Jesus and calle Zamora each year. *Nine thousand net tons of freight per month.*

But do these figures actually cover the present freight traffic? Let us glance again at the table of imports.

In 1932 the imports of motor spirits amounted to 120,611,592 liters, as against 19,633,663 in 1923; while lubricating oil imports jumped from 7,194,278 liters in 1923 to 17,006,949 liters in 1932. In other words gasoline dispatches were six times greater in 1932 than in 1923; while lubricating oil dispatches had more than doubled. This gives some idea of the tremendous and rapidly increasing traffic tonnage which chokes Jesus and Zamora streets, which might be diverted from the Jones and Ayala bridges and crowded downtown streets by the completion of the Mendiola project and the widening of callejon Jesus sufficiently to accommodate four lines of traffic.

To give this portrayal even greater clarity let us contrast the number of truck trips in 1923 with that of 1932. In 1923 there were some heavy trucks and bulk-lorries operating between Pandacan and the downtown districts, averaging three round trips per day—48 1-way trips on calle Zamora, exclusive of miscellaneous freight traffic. To-day, between 30 and 35 heavy trucks and lorries carry petroleum products over this street, on an average of three times each per day—180 1-way trips daily, or 18 trips per hour, estimating a 10-hour day. Yet Jesus and Zamora streets are the same width, and in about the same condition as in 1923. Obviously, these streets urgently need widening and thorough asphaltting.

Bear in mind that the foregoing figures indicate only net freight tonnage. Bear in mind also that the flow of traffic is not uniform. One of the largest Pandacan concerns reports freight dispatches numbering from 60 to 120 per day; while an average of 30 customers per day, having their own trucks or other means of transportation, call to take delivery of their orders from the warehouse. It is over-conservative to say that from 300 to 600 loads of freight are dispatched from Pandacan daily, not to mention the produce and miscellaneous stuff that arrives daily. More than one-half of this freight passes over the Jones, the Sta. Cruz, and the Ayala bridges, and through the crowded downtown streets, it is carried in every type of vehicle, from carabao carts to the 5-ton trucks on the oil distributors. Can we balame the police department for the traffic jams at bridgeheads, Goiti and Moraga plazas, and at all street intersections? Would it not be better effectually and permanently to divert from 30 per cent to 50 per cent of this traffic from the Jones and the Ayala bridges and the downtown streets than to widen streets or bridges in the congested sections of the city?

In this article only freight traffic is discussed. Every few minutes a heavy P. U. passenger truck rumbles menacingly along calle Zamora, through a maze of pedestrians, carromatas, cyclists and carabao carts. Accidents are frequent. It is a credit to drivers that so few casualties have occurred. But it is because, realizing the danger, and speed being practically impossible, the drivers are more careful in the Pandacan district than elsewhere. The fact remains that about 50 per cent of this passenger traffic would be permanently diverted by the opening of Mendiola street and construction of the Mendiola bridge across the Pasig river. The best way to relieve traffic jams on Manila's bridges and downtown streets is to build another bridge.

The City of Yokohama

(Continued from page 76)

hospital, a quarantine hospital and a sanatorium for tuberculosis patients. Besides, there is a hospital established and maintained on money sent from America for relief of sufferers from the Earthquake. The Juzen Hospital is the oldest hospital in Japan, and is the biggest of the hospitals in the city.

The Central Wholesale Market has been established by the Municipality for the purposes of supplying to the citizens fresh food and of controlling prices. It is ideally equipped and annually handles about 100,000 tons, valued at Y.25,000,000.

Yokohama Harbor, Yokohama Pier, part of Yokohama Mill District, Hotel New Grand, Yokohama Hall, City Commercial Rooms (or Commercial Sample Rooms), Yokohama Silk Conditioning House, Silk Experiment Station, Kanagawa Prefectural Office, Nishidani Cleaning Bed, Yamashita Park, Nogeyama Park, Isezaki-cho, Negishi Race-course of the Japan Race Club, and Hodogaya Golf Links are all Municipal developments.

The following are extracts from the latest statistics of the Yokohama Municipality:—

	Square kilometers
Area of the City	133,876
Population of the City (At end of 1931)	640,800
Ratio of population per square kilometer	4,787
Yearly revenue and expenditure of the City (for the fiscal year 1933-1934) :	
Revenue	Y.46,265,160
Expenditure	46,265,160
General account :	
Revenue	15,260,789
Expenditure	15,260,789
Special account :	
Revenue	31,004,371
Expenditure	31,004,371

Overhead Contact Lines of the South Indian Electric Suburban Railway

(Continued from page 73)

A further special feature worth mentioning is the earth wire. It consists of a 0.07 sq. in. copper cable, run over the bracket arms or the tops of the poles and connected by means of special clamps to all the poles and steel structures along the line liable to come into contact with the contact line, and to the truck return (rails). The earthing of these parts is therefore perfect.

The work on the described installation was begun in the spring of 1930 and completed in the spring of 1931, so that in May 1931 the electrified railway could be opened to the public. The

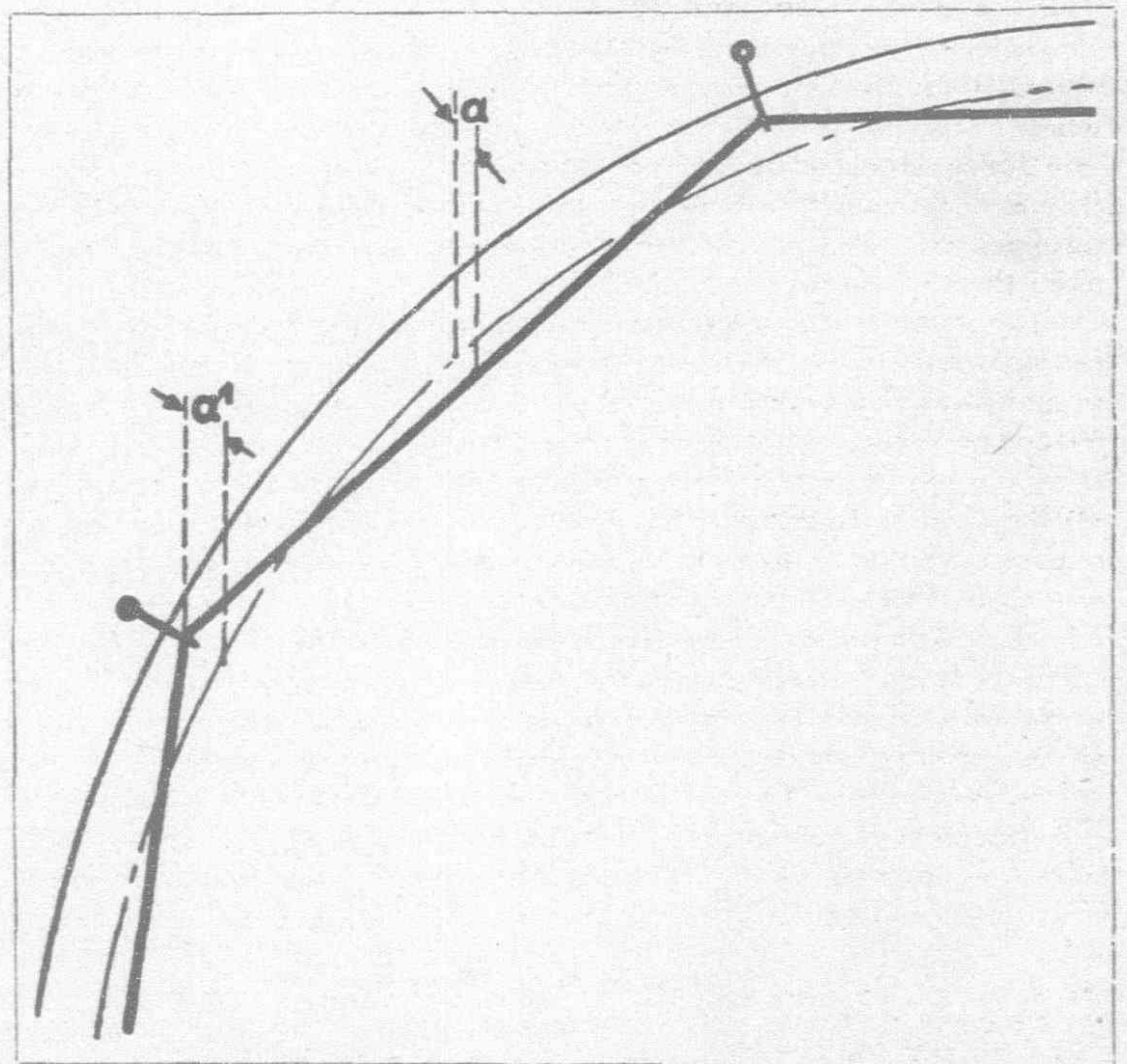


Fig. 12.—Position of contact wires at curves

whole project for the electrification was prepared by the Consulting Engineers of the South Indian Railway Co., Ltd., Messrs. Robert White and Partners, Victoria Street, London, who were also responsible for the supervision of all erection work. The work was carried out, partly by the South Indian Railway Co., Ltd. themselves and partly by Messrs. Siemens-Schuckertwerke A.-G. of Berlin, as Contractors. The South Indian Railway Company Ltd. made the foundations and erected the steel structures, Messrs. SSW supplied and installed the whole gear for the overhead contact lines.

Aspects of Burma's Textile Industry*

By R. N. KHARAS, F.R.S.A., A.R.P.S.

NEXT to agriculture the handloom industry provides employment to the largest number of persons in Burma. The hand-spinning and hand-weaving industry has a double motive behind it—the alienation of national poverty on account of widespread unemployment and the attainment of freedom through economic independence. The people of this beautiful land of the Pagodas have fine taste for textiles. Unfortunately this industry is passing through the throes of an economic crisis, and that too at such a time that while other industries have been receiving progressive assistance in the form of protection against foreign competition, the handloom industry has been steadily deteriorating and very little attention is being paid to its improvement and organization on a more efficient scale. Anybody who has acquainted himself with world events will readily admit that the free trade policy is a theoretic ideal only and has not existed permanently in any one country, and even England, which has built up its industries under the shelter of state protective duties and then adopted a free trade policy in most but not all the articles as suitable to her interest, has now again reverted to a protective policy in the post-war period under the cover of the Safeguarding of Industries Act of the British Parliament. The plight of the handloom weavers can easily be judged by a glance at the gradually increasing import figures of foreign textiles. Apart from the question of protection, why should this most indigenous industry slowly deteriorate? Have the people altogether changed their taste that they do not want any more hand-woven cloth? Or is it that the weavers themselves are ignoring this staple industry for one reason or other and taking up some other more lucrative jobs? There are so many factors to be considered that it is essential in the first place to review the whole industry.

In Burma cotton is not manufactured into goods on a commercial scale. It is only a cottage industry employing rough antiquated appliances. There are about 550,000 handlooms in Burma employing some 70,000 people as whole-time workers. Almost 99 per cent of looms at present used by the villagers are hand-throw shuttle type which are clumsy and slow and are not suitable for making wide cloth. There are some fly-shuttle looms working which are, however, more efficient and suitable for the cottage weavers. Any student of handloom economics would find this staple industry of Burma in a state of gross negligence. There is one consolation, however, that the province can boast of a Government Weaving Institute at Amarapura. But the knowledge of weaving imparted by this single weaving institution is not sufficient and does not make the slightest improvement in the general weaving population of Burma.

The present marketing of the handloom goods is done by the weavers themselves who expose their goods on bazaar days in certain patterns and styles only for which the weavers think they can find a ready sale in their particular village without any knowledge as to the extent of demand. The result is that there is always over-production in a particular style. The local weaver finds himself at a disadvantage with the seller of foreign cloths in his own market, where the foreign design and color attract more of

his fellowmen. The tastes of the people have changed so thoroughly by the introduction of foreign fashions, and foreign cloths with less artistic but more gaudy colors and designs, that some of the best local-made patterns have received a definite setback.

In view of the present distressed condition of the handloom weavers it is most essential to organize co-operative societies, for giving financial help to the handloom weavers and promoting technical education and knowledge of improved methods of weaving to them, and for helping them to advantageously market their produce. The traditional occupation of the handloom weavers, including the perfected system of child apprenticeship that is an integral part of it, cannot be substituted by any other occupation. There can be no hope of a parallel built on the history of industrialization in the West. After all the handloom industry, which is built on the rock of social organization, can boast of capital, labor and land entirely and purely Burmese.

The following proposition goes to suggest some means in order to improve the present condition of the weavers:—

Firstly, the Government should establish a commercial intelligence bureau which would be publishing periodicals in vernacular in which the position of the handloom-woven goods and the condition of the cloth market in general should be given for the advantage of the weavers. It is also necessary that practical hints should be given to introduce new and artistic designs, method and use of various starching products and to popularize the use of improved fly-shuttle looms among the weavers. Publication of such periodicals will be a great help to the weavers, as unlike India, cent per cent of literacy among the Burmese weavers will find the periodical a welcome in every weaver's home. But mere propaganda will not do, if carried out on a theoretic ground. Such a Commercial Intelligence Bureau as suggested should be a permanent organization which will collect samples, prices and other materials for publication

for the information of the public also from time to time. The public will also feel that no longer would they be deceived and carried away by the lustre of shining silks and Glasgow mulls. Such constructive sphere of work will bring manifold blessings to Burma's handloom industry and give it a correct lead and fresh impetus.

Every important weaving center should have weaving schools in which elementary teaching in weaving would be given. To start with, centers like Mandalay, Prome, Myeinyan and Monywa would suffice for the present for the establishment of such schools. General and technical training should be given side by side in order to create well-informed, intelligent and efficient artisans. Elementary knowledge of accounts and drawing should also be given in addition to weaving. By the time such students leave school and enter the industry as workers, they should be in a position to understand the qualities of a design, the way to copy it and work with such designs. Such weavers, even with the elementary knowledge but systematically imparted to them in weaving schools, will be able to change the patterns and designs with which they work than the present weavers who have not got the necessary



Lake villages at Nampan, an important weaving center in Southern Shan States

scope for such expansion due to insufficient training and lack of guidance so long. It is precisely in this way that such trained student workers can find an opportunity to show their mettle. It is no use talking nonsense about other lands. On Burmese men and women is laid the responsibility of caring for the poor Burmese, and so let them take to the work in right earnest, leaving aside other tall talk.

The inventive capacity of the handloom weavers varies according to the general average technical skill of the weavers. The weavers, as a class, have no inventive power. They have been working definitely on conservative lines, that is to say, on the same old patterns which their grandfathers were working hitherto. A rational change is necessary here in order to compete with machine-woven modern patterns. As every weaver acquires a certain technical skill and efficiency after the end of the school term, the inventive capacity is bound to increase to a certain extent. Thus with this freshly acquired knowledge the weaver will find strength and support in his own reproductive capacity to hold his own in open competition with the rest of the world.

There should also be established a Weaving High School, located preferably in Prome or Mandalay, where students who are anxious to get higher training in weaving, dyeing or printing should be allowed to proceed from the elementary weaving schools. Here a thorough knowledge in the working of a design, the art of printing and dyeing and knowledge of various weaving machines and business methods should be given to students who want to specialize in any of these branches. Imparting of such education will ensure that a weaver, dyer, printer or a weaving mechanic has sufficient knowledge and skill to look after himself after his graduation from the High School and to develop the industry of his motherland on the right lines. Thus we have ample room for individual development as a result of the sagacious working of the above comprehensive plan. After all, it is not wisdom to let the unsurpassed skill and art of the Burmese weaver be killed by the cheap competition of machine-made cloth, whether Indian or foreign. Some may be callous about unemployment and starvation in India. They may look calmly on the death of human beings, but the death of an art or industry would be in a sense more tragic than the death of men and women. For these can be supplemented by a fresh generation, but the former would be lost for ever.

We have come so far to the weaving side of this industry. It would not be out of place here to look on the other side and mention something about the spinning industry which naturally is closely linked to the weaving industry.

In Burma there are roughly 325,000 acres of land under cotton cultivation, the principal districts being Mye ingy an, Meiktila, Theyetmyo and the Shan States, and the approximate total annual outturn from these and other minor cotton districts is some 12,000 tons of lint or cleaned cotton.

There are three commercially important species of cotton in Burma:—

(1) *The Wagale*.—It comprises the three varieties scientifically known as (a) *Gossypium Neglectum Burmanicum*, (b) *Gossypium Neglectum Rosium Avensis*, and (c) *Gossypium Neglectum Varum Kokatia*.

(2) *The Wagyi*.—It has only one variety called *Gossypium Obtusifolium*.

(3) *The Shan States Cotton*.—A botanical survey of these cottons is in progress.

Of the three kinds of Burmese cotton, the Wagale has a short staple of about $\frac{5}{8}$ of an inch in length, having an average spinning capacity of about 10 counts, and ginning to 38 per cent. The average staple of this quality is considerably superior to Bengals.

The Wagyi has a weak staple measuring about $\frac{6}{8}$ of an inch and ginning to 40 per cent with spinning capacity from 12 to 14

counts. Owing to its low tensile strength the yarn is unsuitable, unless mixed with other strong cotton of same fibre length.

The Shan cotton is the best of the three with the longest staple measuring up to about 1 inch in length. Its spinning capacity is about 16 counts and ginning 28 per cent.

It is regrettable that no steps have been taken to improve the qualities of Burmese cotton, and more so when we find that such an improvement is all the more conducive to Burma's national progress. There is a large field for the Agricultural Research Institute to explore and work in this direction in the interest of the industry and cotton growers of the province. It is true that Burmese agriculturists and people on the whole are most conservative and hopelessly lethargic to any innovation, and they would abhor any idea of manuring their fields or the employing of modern scientific implements of agriculture. (A very sad instance we have before us is of the deterioration of Burmese rice which is responsible also to a certain extent of the fall of its rice trade, too, due to the neglect of mother earth by its own sons of the soil.)

But we can be sure that this indifference of a unique and most hospitable people in the world will change with the course of time and constructive work by the Agricultural Research Institute will bring immense possibilities to agriculturists in general to increase their area and the crop.

With the annual output of 12,000 tons of cleaned cotton, questions would naturally arise whether there are any possibilities of starting cotton spinning mills, and whether there is a market for the sale of cotton yarn in Burma. According to the Government figures, Burma's average yearly import in cotton yarn is about 12,000,000 pounds, or about 30,000 bales. Over 90 per cent of this cotton yarn comes from India, and the rest from England, Japan and other foreign countries. This immense quantity of import of yarn will show that Burma has the first essential factor—the market. Therefore, if it is contemplated to manufacture only cotton yarn for her local consumption, Burma should have about six cotton spinning mills with 10,000 spindles each. The local cultivation can supply 12,000 tons of lint cotton yearly which would be more than sufficient for six cotton



Burmese villagers dyeing with Naphthol

spinning mills with 10,000 spindles each, which can supply her local needs the major portion of the similar imported yarn. Some would advocate that to start with only 2,000 to 5,000 spindles will suffice in the beginning per each mill. But this would be suicidal in the end and will not be advantageous at all for many reasons. A mill with 10,000 spindles working 10 hours a day should give an average production of 6,250 lbs. of No. 12 count. This will average a daily production of about 15 bales. However, it would be a paying proposition if, instead of mammoth mills, we have a number of smaller mills distributed through all sections where cotton is grown. The section that produces the raw material ought to produce also the finished product. It is fallacious to suppose that industry and agriculture are separate and distinct branches of activity. Actually they fit into each other very neatly. The farm has its slack seasons, and so has industry. The two can be made to fit in together, and the result will be more and cheaper goods and food for everyone. Curiously and quite correctly is nearly the above view of one of the most modern manufacturers in the most prosperous of all the countries, and when this view is translated into reality, we find the hand-spinning and hand-weaving industry bearing easily a close resemblance to the above view of Mr. Ford on principle.

To work a mill of 10,000 spindles at least 125 hands will be required. The greatest difficulty will be encountered here, to find adequate Burmese labor. These hopelessly lethargic people abhor any manual work and they are not used to any factory

(Continued on page 95)

Road Construction in China*

ANQUESTIONABLY one of China's greatest needs to-day is the provision of better means of communication. These are essential if the country is to be unified in the real sense of the word. Only by travel can her people "get acquainted" with each other, and the barriers raised by different dialects, different customs, and often a different mental outlook be broken down. Only by intercourse with each other can the people attain to a proper understanding of each other, and of the fact that, whether they come from north or from the south, from the east or from the west, whether Szechuen be their province or Chekiang, Hopei or Yunnan, they are all Chinese, members of one race, with a common cultural heritage and a common destiny. But travelling is impossible without adequate and speedy means of communication. The same lack makes it impossible for any administration to function successfully especially over so vast an area as China, while, last but by no means least, it is hopeless to expect trade, industry and commerce to flourish and develop under such conditions.

In her long coastline and the network of inland waterways comprised by her many navigable rivers and system of canals China possesses, it is true, an asset of great value, though at some times one may be inclined to wonder whether it has not been in one sense a drawback, since its existence has apparently seemed to obviate in the eyes of many the need of developing any other system. The absence of railways and especially of roads can possibly be attributed in part to the fact that over such wide areas water transport and travel is so convenient. At present the country only possesses 10,000 miles of the former, and 40,000 miles of the latter, to which must be added the facilities afforded by two infant air services. What this must mean can be easily realized when its effect on trade for example is taken. The average cost of transport in China is stated to be 15 times that in the United States of America.

Of the three, roads, railways, and air services, roads are undoubtedly the prime necessity, if only for the fact that without roads to feed them railways are themselves robbed of ninety per cent of their potential value. Moreover the difference in the construction cost per mile between road and railway is an important factor, when the tremendous amount China has to do is compared with the small means at her disposal. For a road the maximum cost is round about \$9,000 per mile and this is for macadam in mountainous districts; for a mud road in the plains the cost falls to \$3,000. The very minimum for a railway is put at \$19,000 for a two foot gauge. For a standard gauge track the figure ranges between \$50,000 and \$125,000.

The following figures are eloquent enough of the great need for roads.

	Roads	Area	Roads	Area
The United Kingdom	1 mile per 0.5 sq. miles or 2		miles per 1 sq. mile	
The United States	1 " " 1.0 " " 1		" " 1 " "	
The World	1 " " 6.6 " " .15		" " 1 " "	
China	1 " " 241 " " .004		" " 1 " "	

To reach the same standard as the United Kingdom, China needs 8,564,000 miles, as the United States 4,282,000 miles, as the World 630,000 miles, and this at the rate of progress at the moment anticipated by the Bureau of Public roads, roughly about 2,500 miles per year at the very outside, would take 3,400 years, 1,700 years and 250 years respectively. If these figures are not considered a fair comparison those for Asia as a whole can be taken. Here we find one mile of road to 10 square miles of area. It would take China 171 years to build the 42,000 miles demanded by this standard. It is obvious that a greatly accelerated rate of construction is necessary. Finance of course is the deciding factor, but if England can spend as she does some £50,000,000 annually on maintaining and improving her road system (in 1927-8 she spent £60 million), surely China can afford more than the bare million which is all she contemplates at present.

In case these figures are not sufficiently impressive the following passage from the *Chinese Economic Bulletin* for October 29, 1932, indicative of what they mean when translated into actual conditions is quoted. "It must be borne in mind that south of the Yangtze River wheeled traffic is almost unknown (foreign style vehicles in some of the modernized cities being excepted), and roads as such do

not exist—simply footpaths just wide enough to trundle a wheelbarrow along. Even the use of wheelbarrows is confined to the Yangtze Delta, and this primitive vehicle is never made use of to travel long distances. People living in the coastal regions or on the plains of Kiangsu, Chekiang and Anhwei provinces can make use of boats as means of communication, but in the hilly districts, such as those traversed by the Nanking-Hangchow and other highways under construction, where navigable waterways do not exist and pack animals are rarely used, the carrying coolie and the sedan chair still represent the only means of conveyance. In such conditions travelling and transport is slow and difficult, but with the completion of the modern highways transportation facilities will be provided for these backward regions which have been hitherto utterly impracticable."

But China was not always so backward as this. At one time her rulers and her people were at least passably road minded. Tradition ascribes the first efforts at road building to the rulers of the third millenium B.C. Later the Chow dynasty established a special department for roads. In the first and second century A.D. there was contact with the Romans some of whose ideas may possibly have been adopted. The Tang dynasty made the care and construction of roads the business of the Board of War. Gradually an extensive system of courier routes was built up, until by the time of Genghiz Khan there were 2,600 miles of highways completely repaired and improved.

Ancient Courier Routes

In all there were twelve of these:—

- (1) Peking-Tungchow-Yungping-Shanhaikuan-Mukden.
- (2) Peking-Jehol-Tsitsihar.
- (3) Peking-Dolonor-Khailar.
- (4) Peking-Kalgan-Urga-Maimachin-Kiachta.
- (5) Peking-Kalgan-Kweihauting-Uliassutai-Kobdo-Semipalatinsk.
- (6) Peking-Taiyuan-Lanchow-Liangchow-Suchow (Gobi Desert)-Hami-Urumtsi-Kashgar.
- (7) Peking-Lanchow-Sining-Dangar-Kokonor-Nakehuka-Lhasa-Gartok.
- (8) Peking-Taiyuan-Sian-Chengtuo-Tatsienlu-Lhasa.
- (9) Peking-Chengting-Kaifeng-Siangyung-Changteh-Kweiyang-Yunnan-Tali-Bhamo.
- (10) Peking-Chenting-Kaifeng-Hankow-Yochow-Hangchow-Kweilin.
- (11) Peking-Tehchow-Hsuchow-Luchow-Kiukiang-Nanchang-Canton (Ambassador's Road).
- (12) Peking-Tehchow-Hsuchow-Chinkiang-Hangchow-Wenchow-Foochow.

These roads were cut in as direct a line as possible, often being cut out of hillsides or running through tunnels. On the plains they were up to 20 to 25 yards in width, in many places paved. By their means it was possible for imperial messengers to reach any part of the country in a comparatively short space of time. The journey from Peking to Canton, for example, could be made in ten days. With the accession of the Ming dynasty government interest in roads gradually declined, the Manchus were equally regardless of the necessity for keeping up these courier routes, and slowly but surely they fell into decay, until to-day they have practically disappeared. Only in a few odd places are they still discernible and passable—the Sian-Chengtuo stone highway is a case in point. By the beginning of the present century roads, as far as any existed, were merely cart tracks, quite undeserving of the name of road as understood in nineteenth century Europe. Any construction or repair work that was done—with the exception of the foreign concessions and leased territories which are rather outside the purview of the present article—was due to spasmodic outbursts of energy of the part of provincial authorities, military governors or associations of farmers or private business interests, and these were not particularly effective. According to the National Good Roads Association there were as late as 1921 only 100 miles of real roads in China outside the areas under foreign control.

*The People's Tribune.

The first impetus towards a really systematic road construction policy was given in 1913 by Mr. Lo Kou-shiu, of the Ministry of Communications at Peking. He advocated the adoption of a highway program as a supplement to the plans for a national system of railways then being drawn up. Quite rightly he held that railways without roads to feed them could not possibly bring in adequate returns. His persistence was eventually rewarded in 1919 by a presidential mandate laying down regulations for the building of national highways, but there his success ended. The regulations remained a dead letter as far as any actual construction was concerned. The first real work was done as a result of the efforts of the American Red Cross Society which in 1920-21 spent \$2,445,000 in building 850 miles of roads in Hopei, Honan, Shansi and Shantung as part of their famine relief program. Their example awakened a general desire for better roads, and the enthusiasm of the moment was seized on by a group of individuals at Shanghai, who, under the leadership of Dr. C. T. Wang, founded the National Good Roads Association, which has since been active in impressing the necessity of more and better roads on the general public and stimulating the authorities to action. In 1921 it registered with the Canton Government and in March, 1922, it brought out the first number of its "Good Roads Monthly," which has now reached its 125th issue and attained a circulation of 20,000. It sent officials round the country on lecture and propaganda tours, who aided in the formation of local branches and often gave valuable assistance and advice on local construction projects. From time to time it has issued books and charts containing the latest information on existing roads and those in contemplation, and finally it has sent selected members on world tours to study the highway systems of other countries. In 1931 it held a very successful Good Roads Exhibition at Shanghai.

Until 1927 and the formation of the National Government at Nanking there was no Central Government able to tackle the problem, and even after that date the Central authorities, while fully alive to the vital character of the road problem, could do little more than formulate plans. Dr. Sun Yat-sen in his Plan for the International Development of China (1919) spoke of a million miles of macadam roads, and his son, Mr. Sun Fo, in 1928 in his Ten-Year Plan envisaged a system of 100,000 miles. The National People's Convention of 1931 passed a six year plan which looked forward to 200,000 miles of new roads by the end of 1935. Such actual work as was done, however, was for some time due to independent action by provincial authorities and military governors, to private enterprise, and to the China International Famine Relief Committee. Most valuable work has been and still is being done by this last body both in actual construction and in providing examples to the people. Up to 1931 it had spent \$2,820,256 in building, maintaining and improving 3,084 miles of roads.

The Nanking Conference

The formation of the National Highways Planning Commission in 1929 marked the first step towards a really national system of roads. Nineteen provinces sent delegates to a conference at Nanking, as the outcome of which definite plans were submitted to the Government, and these resulted in the promulgation of Highway Laws in September the same year. Roads were divided into two classes (1) China Proper Roads, (2) Frontier Defence Lines. The title of the latter sufficiently indicates their character, the former are designed to connect the national with the provincial capitals. They are to pass through the most populous and productive districts linking up important commercial centers, and to act as feeders to railway lines. As far as possible provincial highways in existence or projected are to be incorporated in this system. At the same time they are to follow the course of projected railways, which in fact are to be constructed in the first place as national highways. Twelve of these in all have been scheduled.

(1) *Nanking-Kwangsi Line*.—This is to link up Nanking with Lungchow in Kwangsi passing through Kuyung, Changhing, Hangchow, Wenchow, Foochow, Changchow, Kaifeng, Canton, Wuchow, and Nanning. It is to incorporate the provincial highways of Kiangsu, Chekiang, Fukien, Kwangtung, and Kwangsi. In addition to its commercial and political importance it is important from the point of view of the defence of the South Eastern coast.

(2) *Nanking-Yunnan-Sikang Line*.—Nanking to Kuming via Pukow, Anking, Hankow, Shasi, Changteh, Tungjen, Kweiyang, Panchien and Chuching.

(3) *Nanking-Tibet Line*.—Nanking to Lhasa via Pukow, Luan, Kwangchow, Tunpeh, Fancheng, Yunyang, Paiho, Tungechow, Chengtu, Tachienlu, Litang, Locheng. This line follows course of projected Pukow-Dinyangchow Railway.

(4) *Fukien-Sinking Line*.—Foochow to Ili via Yenping, Kwangtseh, Nancheng, Nanchang, Paicha, Wuchang, Hankow, Siangyang, Yunyang, Sian, Lanchow, Anchang, Hamicheng, Tihwa, and Wusu. This line is important as connecting the north-western with the south-eastern provinces and serving to develop the north-west. In the extreme west its main purpose is for national defence.

(5) *Nanking-Mongolia Line*.—Nanking to Maimaichou via Pukow, Yingchow, Chengchow, Tsechow, Taiyuan, Tatung, Pangkiang, Taoling and Urga. This line is to connect Shasi and Mongolia with Nanking and to facilitate defence of the northern frontier.

(6) *Nanking-Heilungkiang Line*.—Pukow to Heiho via Luho, Haichow, Weihsien, Wuting, Tientsin, Peiping, Chengte, Taonan, Lungkiang and Aihun. Based on the projected provincial highways of Kiangsu, Shantung, and Hopei.

(7) *Kalgan-Suiyuan Line*.—Kalgan to Suiyuan via Chifeng, Singlitun, Mukden, Hailung, Kirin, Wuchang, Fangcheng, Ilan and Lingkiang.

(8) *Kansu-Tibet-Sinkiang Line*.—Sining to Hotien via Yien chih, Lhasa, Niehkamu, Chiatoke and Lotoke.

(9) *Suiyuan-Sinking Line*.—Paotow to Sula via Wuyuan, Ningshia, Sining, Jotsiang, Yutien and Hotien.

(10) *Heilungkiang-Mongolia Line*.—Manchouli to Wusu via Urga, Kobdo, and Tacheng.

(11) *Tihwa-Sula Line*.—Tihwa to Sula via Tulufan, Wensu, and Pachu.

(12) *Shensi-Kwangsi Line*.—Tungkwan to Wuchow via Sian, Hanchung, Tungchuan, Chengtu, Luchow, Kweiyang, Chingyuan and Liuchow.

These plans call for 22,518 miles of roads at an estimated cost of \$364 million. They are to be built over a period of twenty years at first of earth as the provision of some means of communication at all is the first necessity; later they are to be macadamised as money and the occasion allow. A good proportion of those falling in the China Proper category have already been opened, as they consist to a considerable extent of roads which had already been begun in different provinces.

Construction has been placed under the control of the Ministry of Railways, and the following standards as to costs, etc., have been laid down.

	Earth	Macadam
Over level country	\$3,000 per li.	\$5,400 per li.
Moderately hilly country	\$4,000 ..	\$6,000 ..
Mountainous country	\$7,000 ..	\$9,000 ..

Regulations have also been issued governing the terms and condition on which private transport companies may use the roads, the raising of funds, and the conscription of labor, of which the following are the most important provisions.

Private Transport companies are allowed the use of the roads on the payment of rent. Their charges are to be fixed by the Ministry and the equipment to be subject to inspection by government officials. Part of their profits are also to go to the Ministry.

The construction of roads in the internal provinces is to be financed by a surtax on farmland, supplemented if necessary by a customs and salt surtax. In the outlying provinces it is to be financed by a customs and salt surtax plus appropriations from the basic customs and salt funds. On the security of these surtaxes plus the profits from the highways public loans, Bonds and Debentures can be issued.

All male residents between the ages of 18 and 50 of the districts through which these national highways pass and of their adjacent hsien districts are liable for pressed labor on road construction. They will be provided with food and if necessary shelter, but must provide their own tools.

Projects in View

In January, 1932, a Commission on Highways was appointed by the National Economic Council which became first a Highway Department and is now known as the Bureau of Public Roads. Since then progress has been greatly accelerated. Attention was at concentrated on the "Three-Province Program" for linking up the existing highways in Chekiang, Anhwei and Kiangsu. This has already been largely completed. The six highways, Nanking-Hangchow, Shanghai-Hangchow, Soochow-Kashing, Nanking-Wuhu,

Changching-Suichang, Hangchow-Hweichow are designed to link up the chief of these provinces, and tap a number of areas of considerable commercial and industrial possibilities. The Bureau is now concerning itself with a "Seven-Province Program" for the linking up of 13,670 miles of roads in Hunan, Honan, Hupeh, Kiangsi, Anhwei, Kiangsu and Chekiang. A road fund of G. \$250,000 has been created by appropriation from the national treasury and placed at the Bureau's disposal. This it utilizes in the form of loans to provincial authorities. From thirty to forty per cent of the estimated cost is advanced in instalments as the work progresses. Definite arrangements are made for repayment, so that the fund may be maintained as a revolving source. A portion of the proceeds of the National State Lotteries is also to be allotted to road con-

struction purposes. A scheme has also been outlined for raising a loan of G. \$23,000,000, but how it is actually to be financed has not yet been determined.

In November, 1932, the Bureau issued regulations opening the inter-provincial roads to all properly licensed vehicles free of any further charge. Previously many toll roads existed, and over some sections motor transport was restricted as a provincial monopoly.

Ninety per cent of the roads are of mud. The usual method of construction is to cut or fill the proposed track to the required level after which it may be rolled, but as often as not is left for traffic to beat down. If rock is near it is occasionally used for foundation or surfacing purposes. In the latter case it is generally hand broken, placed on the road and filled in with sand or loose earth. There is

Province	Mileage		Type	By Whom Constructed	No. of Motor Vehicles	Notes
	(a)	(b)				
Anhwei	960	1050	Dirt.	Prov. Auth. C.I.F.R.C. 389 \$196,000	117	Many motor bus services.
Chahar	150	600	Dirt.	Gen. Feng's troops C.I.F.R.C. 60	120	Roads mainly old caravan routes and improved car tracks.
Chekiang	550	285	Mainly dirt but some macadam.	Prov. Auth., Private Interests,	647	Forty motor transport companies operate over Kalgan-Urga route. Many more roads projected. Chekiang led way in road building. First mooted them in 1916.
Fukien	900	1300	Mainly dirt but occasionally stone surfaced.	Prov. Auth., Private Interests, Military	820	Many roads constructed by forced hand labor. Situated mostly in south as north too mountainous.
Honan	940		Dirt.	C.I.F.R.C. 985 \$343,000 A.R.C. 39 \$100,000 Prov. Auth., Military	164	Miss V. Smith gives mileage as (a) 2109 (b) 1145 in 1930.
Hopei	914	218	Dirt.	Former Peking Government C.I.F.R.C. 166 \$138,000 A.R.C. 133 \$244,000 Prov. Auth., Priv. Interests	4,182	Car figures include Peiping and Tientsin. Only 131 outside these cities. Miss V. Smith gives mileage as 2437 in 1930.
Hunan	740	300	Dirt, crushed stone.	C.I.F.R.C. 56 \$550,000 Prov. Auth.	299	
Hupeh	900	2275	Mainly dirt some crushed stone.	Prov. Auth.	825	Car figures include Hankow bus services over nearly whole length of road system.
Jehol	1345	963	Dirt.	C.I.F.R.C. 95 \$9,000	65	Miss V. Smith in 1930 says only old caravan routes about 440 miles fit for motor traffic.
Kansu	1962		Dirt.	Prov. Auth. C.I.F.R.C. 271 \$356,805	39	Roads part of N.W. system 1929-30 C.I.F.R.C. improved 700 miles of cart roads. 1931 new road program. Sian-Lanchow road begun.
Kiangsi	388	1633	Dirt, broken stone.	Prov. Auth. C.I.F.R.C. 10 \$75,000 Military	199	Roads until recently very poor—traffic chiefly water borne. 1927 program adopted for seven main roads financed by surtax on salt. Transport services with over 100 passengers and freight vehicles.
Kiangsu	700		Mainly dirt but some stone surfaced.	Prov. Auth., Private Interests, Military C.I.F.R.C. 7 \$20,000	18,000	Car figures include Shanghai swollen possibly by double registration. 266 miles of modern roads in foreign settlements.
Kwangsi	1300	1000	Dirt.	Prov. Auth.	234	More progress here since 1929 than almost any other province.
Shantung	1640	980	Dirt.	Prov. Auth.	3,728	Figures include Haining Island and Canton. Good waterways: so road construction delayed.
Kweichow	789		Dirt.	Prov. Auth. C.I.F.R.C. 210 \$200,000	67	Very progressive prov. auth., backed by all classes e.g. 1926-27 200,000 men engaged on 600 miles, also soldiers, school children, farmers. Program calls for five trunk roads seven branch lines.
Kwangtung	750	600	Dirt.	Private interests improving caravan routes	5,675	Mainly caravan routes—few well paved roads save in Mukden and other cities. Bus companies along caravan routes.
Mongolia	3760	2800	Dirt.		45	Kalgan-Urga caravan route 700 miles used by motors other highways similar in type. Many bus companies operating over them.
Ningshia	V.S. gives 5920	700	Dirt.	Military, Prov. Auth.	25	V.S. 1930 gives only 440 miles built by Gen. Feng's troops plus ancient trade routes.
Shansi	1472		Dirt.	C.I.F.R.C. 213 \$212,000 A.R.C. 196 \$1,226,000 A.R.C. 485 \$834,000 C.I.F.R.C. 275 \$276,000 Gen. Feng's troops Prov. Auth.	460	Many bus companies—buses common between nearly all large cities. Prov. government maintains good roads. N.B. discrepancy in mileage figures. Highways has seven year program but military disturbances hamper construction. Bus services a prov. govt. monopoly with few exceptions.
Shantung	1260	2430	Dirt but macadam at Tsingtao.			
Shensi	1650	852	Dirt.	Prov. Auth., C.I.F.R.C. 296 \$200,000	190	1930 C.I.F.R.C. with aid of civil and military officials repaired old roads and built 220 miles new ones 25 feet wide. Ancient Sian-Lanchow courier route turned into motor road 425 miles long. Motor bus service Sian to Tungkwan. V.S. says no motor road in 1930—merely remains of old courier and ancient trade routes.
Sikang	3267	1716	Dirt.			
Sinkiang	3556	1931	Dirt.	Prov. soldier labor, Prov. Auth.	50	Merchants use camel routes from Tihwa across S. Gobi to Kalgan or Urga. Also use a southern route via Ansi to Lanchow and Sian but this is long and dangerous. Tihwa-Hsinghsingsi motor road being built (315 m.) Tihwa-Hami section (215 m.) already constructed. 1927. Eight motor road Tihwa-Tancheng (Siberian border built with soldier labor).
Suiyuan	990	2450	Dirt.	C.I.F.R.C. 46 \$5,000 Prov. Auth., Gen. Feng's Troops, Prov. military governors	53	Soldiers built 500 miles also 930 old caravan and courier routes (V.S. 1930) 1930 program calls for network of 13 roads of 940 miles to cost \$700,000. Present roads suitable for motor traffic in winter.
Szechuen	2126	207	Mainly dirt.		478	First impetus given in 1923 by Gen. Yang Seng. People compelled to widen streets, and surrender land without compensation. Now a network of roads radiating from Chengtu.
Kokonor (Tsinghai)	2300	1300	Dirt.			No constructed motor road but ancient courier route sometimes used. Thousands of miles of such passable by cars at a pinch. (V.S. 1930).
Yunnan	1200	800				
	290	1430				
	800	3000				
	V.S. 35					

very little mechanical equipment though in the last three years there has been a growing realization of the advantages of using machinery as evidenced in the purchase of steam and Diesel road rollers, railway dump car equipment, tractors, road graders and air compressors for rock drills. Once a road is finished little or no maintenance work is done.

To get accurate statistics as to road mileage is difficult. There is pretty general agreement on the figure 40,500 as representing the total mileage of motor roads, but beyond that any estimate is very approximate. It is with this provision that the table, on preceding page, giving details of the various provinces, is appended.

Road mileage figures unless otherwise stated are taken from the *Chinese Economic Journal* for August and September, 1933. The column (a) refers to roads actually in use, column (b) to those under construction or projected. V.S. refers to Miss Viola Smith, American Trade Commissioner, Report of February, 1930. C.E.B. stands for *Chinese Economic Bulletin*.

The following further particulars are added in regard to the provinces of Kiangsi, Hunan, Hupeh and Honan, with the reservation again that mileage figures cannot be absolutely guaranteed, if only for the fact that construction is always going on and fresh plans being made, so that the situation is always changing. The figures given are according to the *Chinese Economic Bulletin* of various dates.

Kiangsi.—Six provincial highways have been planned, in addition to a number of inter-hsien roads. It is hoped by the end of the year to have some 600 miles finished. The work is being financed by a surtax of \$1.50 per picul on salt. Transport services have already been opened employing over 100 motor vehicles. The monthly revenue from this source is \$90,000. The six highways mentioned are:

(1) *Kiangsi-Kwangtung*.—Nanchang to Namhung in Kwangtung. Total length 326 miles Nanchang-Sinkan section opened and it is expected to reach Punyu shortly. On other sections work is held up owing to bandit activities.

(2) *Kiangsi-Chekiang*.—Nanchang to Changshan. Total length 198 miles. Nanchang-Yushan section finished. Other sections held up by bandits.

(3) *Kiangsi-Fukien*.—Linchwan to Kwangtseh, Fukien. Total length 108 miles. Whole expected to be finished shortly.

(4) *Kiangsi-Hunan*.—NiuHong to Pingsiang. Total length 57 miles. Some sections completed.

(5) *Kiangsi-Anhwei*.—Yukan to Hukow and Anhwei boundary. Total length 160 miles. Construction started in 1930 but now suspended.

(6) *Kiangsi-Hupeh*.—NiuHong to Kwangmei, Hupeh. Total length 150 miles. Only one small section completed. Rest not even surveyed.

Inter-Hsien Highways are mostly completed. Total length 485 miles of which 350 have been opened to traffic.

The military have also been credited with the construction of 160 miles of road of which 125 are open to traffic.

It will be noted that these statistics taken from the *Chinese Economic Bulletin* for February 18, 1933, vary somewhat from those given in the table above, illustrating the point already made about the difficulty of getting reliable figures.

Hunan.—According to the *Chinese Economic Bulletin* of December 24, 1932, Hunan has now 2,315 miles of motor roads. The *Chinese Economic Journal* figure however is only 740. It is planned to attain a mileage of 13,494 with seven trunk roads as under.

(1) *Hunan-Kwangtung*.—Changsha to Lochong. Total length 845 miles. Changsha-Siangtan and Hengyang-Chenchow sections completed (440 miles). Remaining 405 miles under construction.

(2) *Hunan-Kwangsi*.—Hengyang to Kwangsi. Total length 390 miles of which 60 are under construction.

(3) *Hunan-Kweichow*.—Siantan to Chenyuan. Total length 1,165 miles of which 470 have been built.

(4) *Hunan-Szechuen*.—Siangtan to Yuyang. Total length 1,110 miles.

(5) *Hunan-Kiangsi*.—Changsha to Wantsai. Total length 300 miles of which 60 Changsha to Yungan are under construction.

(6) *Hunan-Hupeh East*.—Huanghwatze via Pingkiang to Tungchen. Total length 480 of which 70 are under construction.

(7) *Hunan-Hupeh West*.—Changsha to Shasi. Total length 695 miles. 100 miles Changsha to Ningsiang completed and 308 Ningsiang to Changteh are under construction.

Hupeh.—Four main highways are planned for this province of which the *Chinese Economic Bulletin*, May 28, 1932, gives the following details.

(1) *Siangyang-Hwayuen*.—Total length 256 miles fully built.

(2) *Hankow-Ichang*.—Total length 223 miles of which the Hankow-Hojung section 168 miles is completed. The remaining section Hojung to Ichang is under construction.

(3) *Siangyang-Shasi*.—Total length 163 miles fully constructed.

(4) *Yotung Trunk Road*.—Hankow to Tsinkiang. Total length 224 miles. 51 miles Hankow, Liusikiang completed remainder under construction.

There are also another 256 miles of completed roads and 58 in various stages of progress.

Honan.—The *Chinese Economic Bulletin* for February 4, 1933, gives the following details of roads in Honan.

(1) *Kaocheng-Tengchow*.—Total length 319 miles completed with traffic moving on the Kaifeng-Nanyang section.

(2) *Anyang-Shangcheng*.—Total length 268 miles completed and all but 13 opened to traffic.

(3) *Shanchow-Sanhohsien*.—Of the total length 623 miles, 80 miles have been finished.

(4) *Yungcheng-Yehsien*.—The whole length 203 miles finished and opened to traffic.

(5) *Loyang-Shuchow*.—Work started on 30 miles of road.

(6) *Chengchow-Nanyang*.—Work expected to start very soon.

Weighing Trains in Motion on the Kiaochow-Tsinan Rly.

(Continued from page 74)

A test train was made up of twelve wagons of varying wheel-bases, and these when pulled at a speed of approximately two miles per hour, were weighed in five minutes over the new weigh-bridge, whereas the operation of weighing a similar train took slightly over half an hour when carried out over a weighbridge of old design.

The new machine has a weighing capacity of 90 metric tons. There are two weighing platforms, one 16-ft. long and the other 29-ft. long, spaced $\frac{1}{2}$ -in. apart.

Live and dead rails are fitted so that traffic not required to be weighed can pass over the weighbridge without imposing any load upon the weighing mechanism. Lubricated bearings prevent rust of these vital parts.

The indicating apparatus comprises a dial graduated up to full capacity by divisions of 100 kilos, and a printing steelyard graduated up to full capacity by divisions of 10 kilos.

The whole weighbridge is self contained in a strong cast iron box frame.

Aspects of Burma's Textile Industry

(Continued from page 91)

discipline. It will be easy to find Indian laborers who are used to factory works anywhere in Burma, but it would be a sorry sight to see all the millhands Indian when their Mongolian brethren are crying "Burma for the Burmans." However, even this defect has its limitations, and with the progress of time and industry such defects are bound to disappear automatically. What is urgently needed is a constructive working of the whole textile problem of the province, and the result is then bound to be great. It only needs experimenting.

New Chinese Railway

In order to develop communications and industries in the provinces of Kwangtung, Kwangsi, Kweichow and Szechuen, the Administrative Council of South-West China has decided to build a railway between Kwangtung and "Yue Chow" in Szechuen.

This railway will begin at Sam Shui and end at Yue Chow.

Regarding the necessary capital, it has been decided that the section from Sam Shui to Ho Yuen be built with money raised in Kwangtung, that the section from Ho Yuen to Lou Chow be built and managed by the Government of Kwangsi, and that from Lou Chow to Kwei Yang and the borders of Szechuen, the enterprise is to be financed by Kweichow province. The Szechuen section be financed and built by Szechuen province.

Engineering Notes

INDUSTRIAL

MANCHURIAN PULP PLAN.—The Manchuria-Mongolia Chemical Fiber Industry Company, to be established shortly, will make wood pulp for paper and rayon manufacturing. Annual capacity will be 10,000 tons for the time being. The plant will have a 1,000 kw. steam generating installation. The scheme is sponsored by Mr. Bungo Yamashita, a large Osaka lumber merchant. The main plant is expected to be erected at Tunhua, along the Tunhua-Tumen Railway, in Kirin. Construction will start in April, 1934. Pulp will be sold in the first half of 1935.

CANTON ENTERPRISE.—The sulphuric acid factory located at Sai Chuen, Canton, is turning out fifteen tons every day. This new enterprise of the Provincial Department of Reconstruction copes with a good demand for the manufacture of armaments and in connection with industries such as tanning, dyeing, printing, etc. The Department is also planning to establish a brewery, iron and steel works, a silk and ramie mill, etc. The municipality also proposes to supply Honam with water by under-river pipes connected to the waterworks at Tseng Po.

MINING

MANCHURIAN COAL FORMATION.—Establishment of the Manchurian Coal Mining Co. has been decided by the Manchoukuo Government and the South Manchurian Railway Co. The company will be capitalized at Y.16,000,000. Manchoukuo will contribute coal mine properties at Peipiao, Moliang, Kuoliu, Hsinliutun and Hsian, said to be worth Y.8,000,000. The S. M. R. will contribute the Hsinking mine, appraised at Y.5,000,000, and Y.3,000,000 in cash.

TO EXPLOIT MINES.—British interests are understood to predominate in a new Company formed by the Franco-Asiatic Bank, the Chosen Corporation, and Japanese interests, to exploit and prospect mines and deposits in Manchoukuo. The capital in the new Company is approximately £50,000. The work will be started as soon as the Manchoukuo Government authorization is granted. The Chosen Corporation is expected to shortly open an agency at Seoul to facilitate the exploitation of the mines.

NEW RUSSIAN PLANT.—A new construction project, Lebyazhstroi, has been started on a slope of Vysokaya mountain near Taguil in the Urals. The plant under construction consist of agglomerating and crushing mills for iron ores of the Lebyazhinsky iron mines. The total cost of construction is estimated at 35,000,000 roubles. The construction works is at its initial stage, houses for workers and a branch railway line being built now.

ELECTRICAL

THE YANGTZE SCHEME.—According to the *Chinese Economic Bulletin*, the proposed Yangtze hydro-electric plant is to be built either at a site four or five li east of Ichang or 20 li above that city. This alternative selection is the result of investigations made by a group of engineers including Mr. Chao Shu-tse, of the National Reconstruction Commission, Mr. Soong Shi-shang, head of the Public Works Department, and several technicians of the Yangtze Conservancy. Both sites, Mr. Soong announced, are suitable as having a normal flow of water and a good position for industrial development. The proposed station, which will cost \$10,000,000, will include a 120,000 kw. plant.

TOSHIN POWER EXTENSION.—Toshin Electric Co. (closely affiliated with Tokyo Electric) has decided to increase its capital from Y.45,530,000 to Y.100,000,000. The increase is connected with the Showa Fertilizer Co., which intends to increase its ammonium sulphate production, for which about 100,000 kw. of power more is needed. The electric concern plans to expand its Akano-gawa, Chikumagawa and Nishikubo power stations.

COMMUNICATIONS

D.E.I. RADIO.—The Dutch Indies Broadcasting Company is to erect a new broadcasting station at Tandjong, and contemplates the erection of several other stations.

TRAMWAYS FOR CANTON.—The Canton Municipal Government is planning two tramways across the city at a cost of about \$2,000,000. It is learned that the trams will be ordered from England through a well-known Hongkong British firm.

CEYLON 'PHONE PROJECT.—The *Ceylon Observer* learns that the Ministry of Communications and Works has instructed the telephone authorities to submit a detailed scheme, together with the estimated cost, for converting the whole of the Central Telephone Exchange into an automatic system. It is understood that the cost of installing the automatic system will be borne from loan funds. The installation of an automatic telephone system in Colombo and thereafter in all the outstations was recommended by Mr. E. Harper, the late Chief Engineer of Telegraphs, three years ago, and the necessary preliminaries were actually carried out when the depression set in, and the whole scheme was shelved for want of funds.

SULZER

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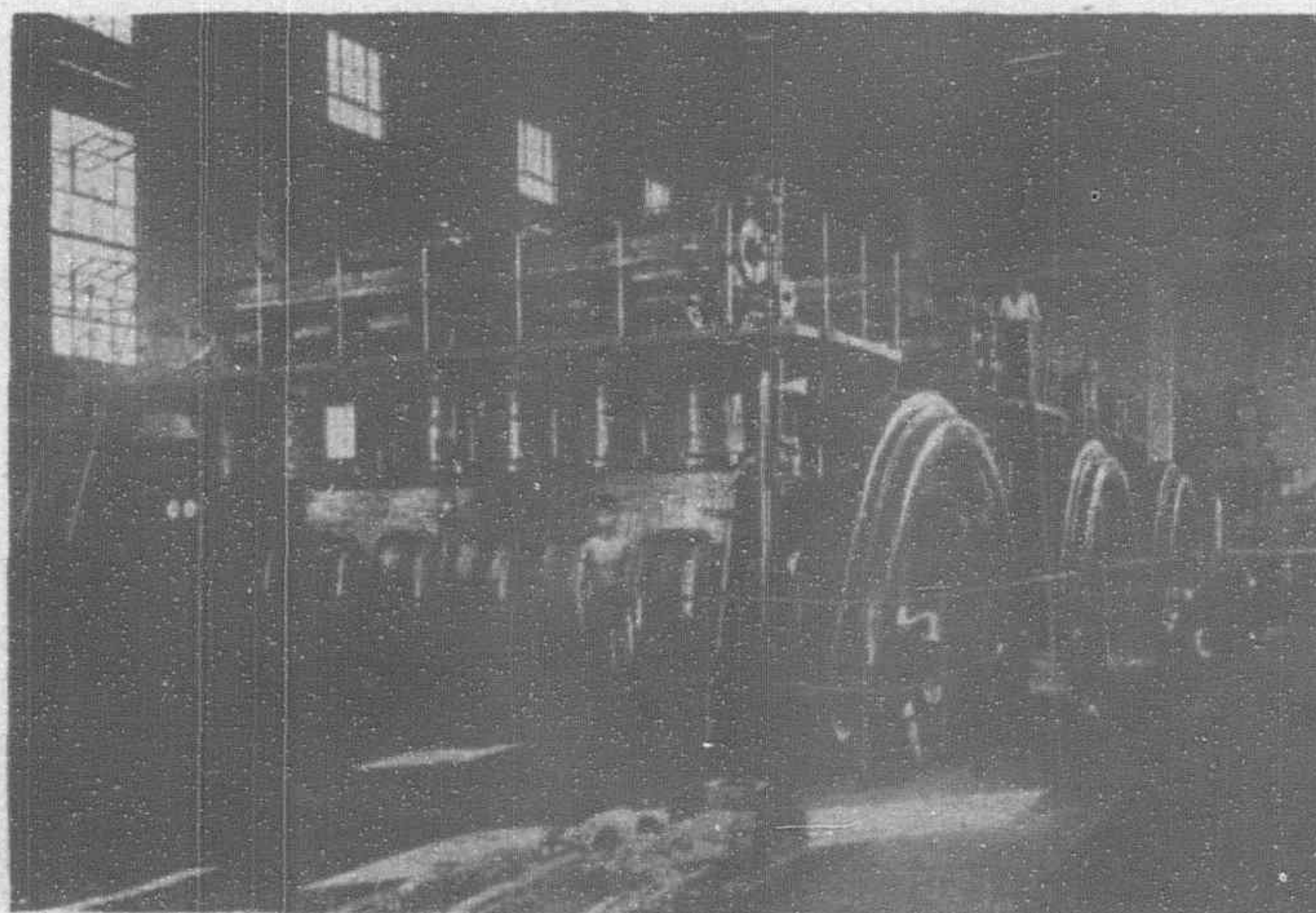
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